



**THE PROPOSED DEVELOPMENT OF A MEMORIAL PARK IN LA MERCY, TONGAAT,
ETHEKWINI MUNICIPALITY, KWAZULU-NATAL**

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

EDTEA REFERENCE NO.: NEW APPLICATION

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DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental Impact Assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental Management Programme (EMPr): A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, inert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and Affected Party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: As per National Environmental Management: Waste Act means-

- a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or
- b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

- (a) a river or spring;
- (b) a natural channel in which water flows regularly or intermittently;
- (c) a wetland, lake or dam into which, or from which, water flows; and
- (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Waste: means any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or

object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 of the National Environmental Management: Waste Amendment Act, 2014.

ABBREVIATIONS

BAR	Basic Assessment Report
DFFE	Department of Forestry, Fisheries and Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELM	eThekweni Local Municipality
ELO	Environmental Liaison Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GA	General Authorisation
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
KZN – EDTEA	Kwa-Zulu Natal Department of Economic Development, Tourism and Environmental Affairs
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SMP	Stormwater Management Plan
WULA	Water Use License Application

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1. INTRODUCTION

1.1 Project Locality

Tongaat Hulett Property proposes the development of La Mercy Memorial Park (LMMP) in La Mercy, Tongaat, eThekweni Municipality, Kwazulu-Natal (Figure 1). The proposed Memorial Park is centrally situated within the La Mercy area with coordinates 29°36'25.92"S; 31°08'20.03"E. It is located to the immediate east of the N2 national freeway which marks the entire western boundary of the site. The site falls within ward 58 of the eThekweni Municipality. The study area and surroundings is currently classified as agriculture but is currently undergoing a rezoning process which will allow for the development of the LMMP on the proposed site.

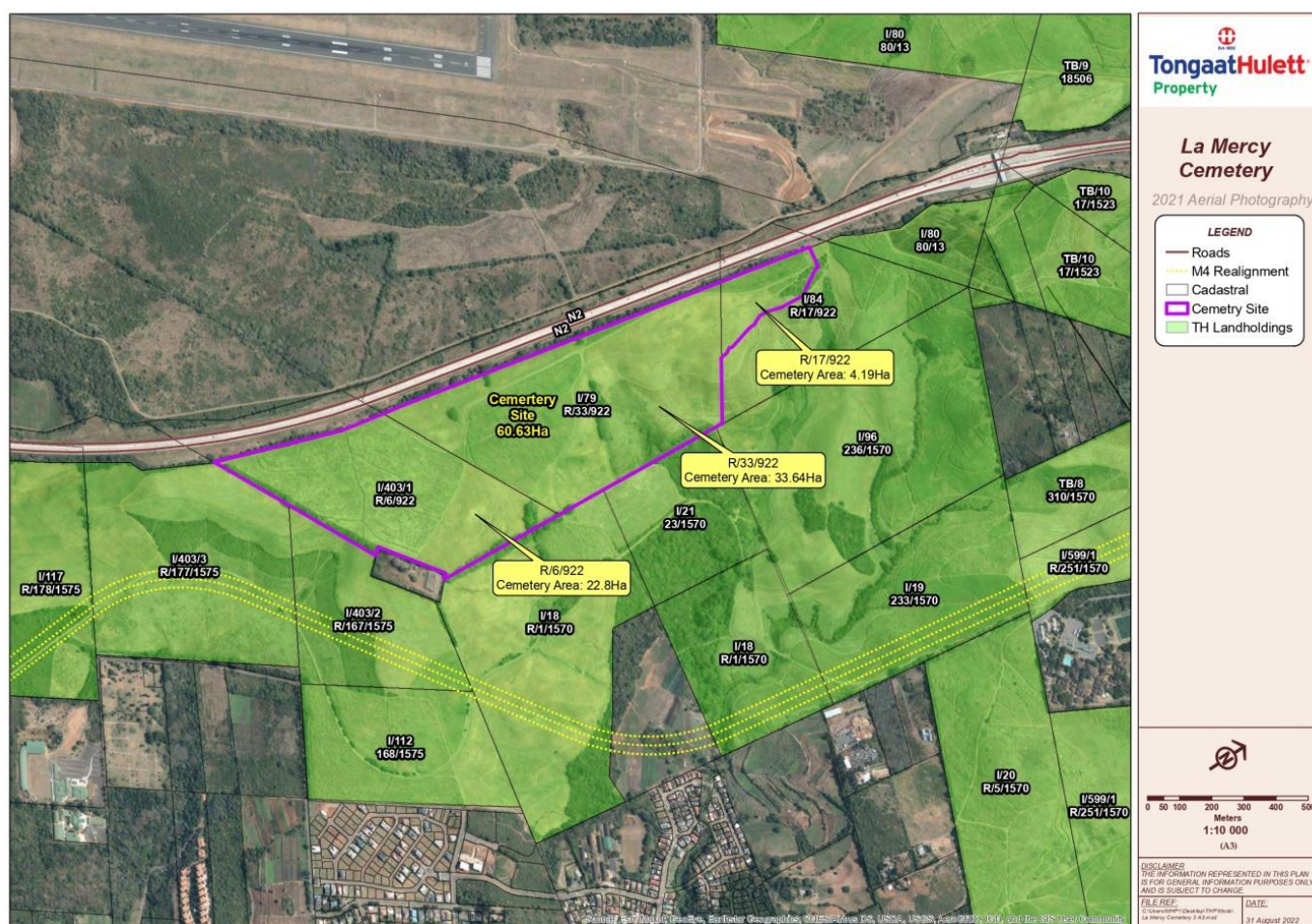


Figure 1: Locality Map (Absolute Location)

The site falls within the following three properties, also depicted in **Error! Reference source not found.** all of which are owned by Tongaat Hulett Property:

Table 1: Properties that the proposed LLMP will be located on

Farm Name			21	Digit	Surveyor	Property Size
			General Code			
1.	Klipfontein Portion 17	922	FU,	N0FU0	0000000092200017	4.17ha
2.	Klipfontein Portion 33	922	FU,	N0FU0	0000000092200033	33.66ha
3.	Klipfontein Portion 6	922	FU,	N0FU0	0000000092200006	22.87ha

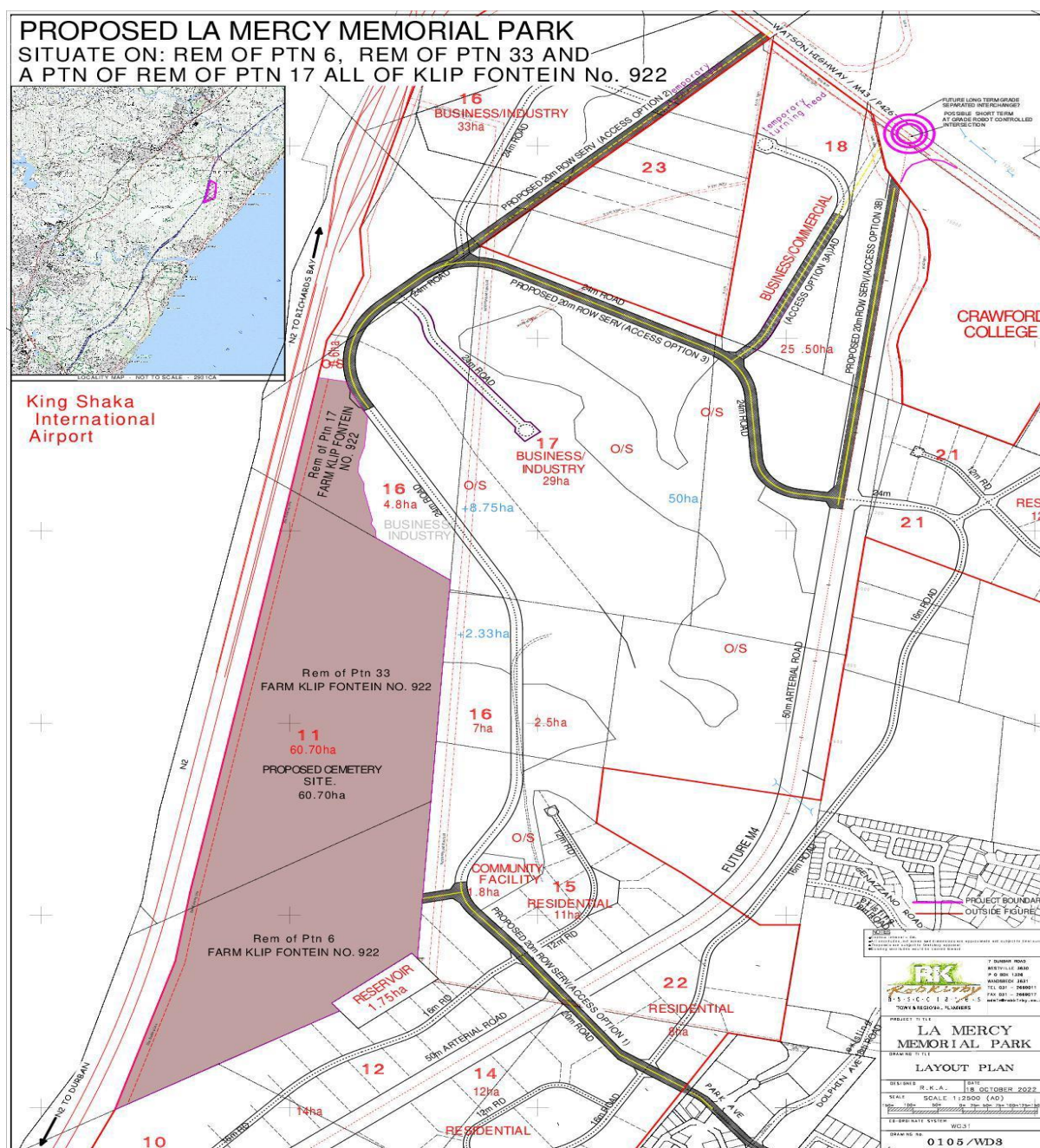


Figure 2: Layout Plan

The proposed memorial park is located north of uMhlanga (15km) and within 13km to the King Shaka International Airport as well as residential areas such as La Mercy (12km), Umdloti (2.8km) and Verulam (6km). It is situated on the northern portion of the eThekweni Municipality. Figure 3 below depicts the relative location of the proposed LLMP.

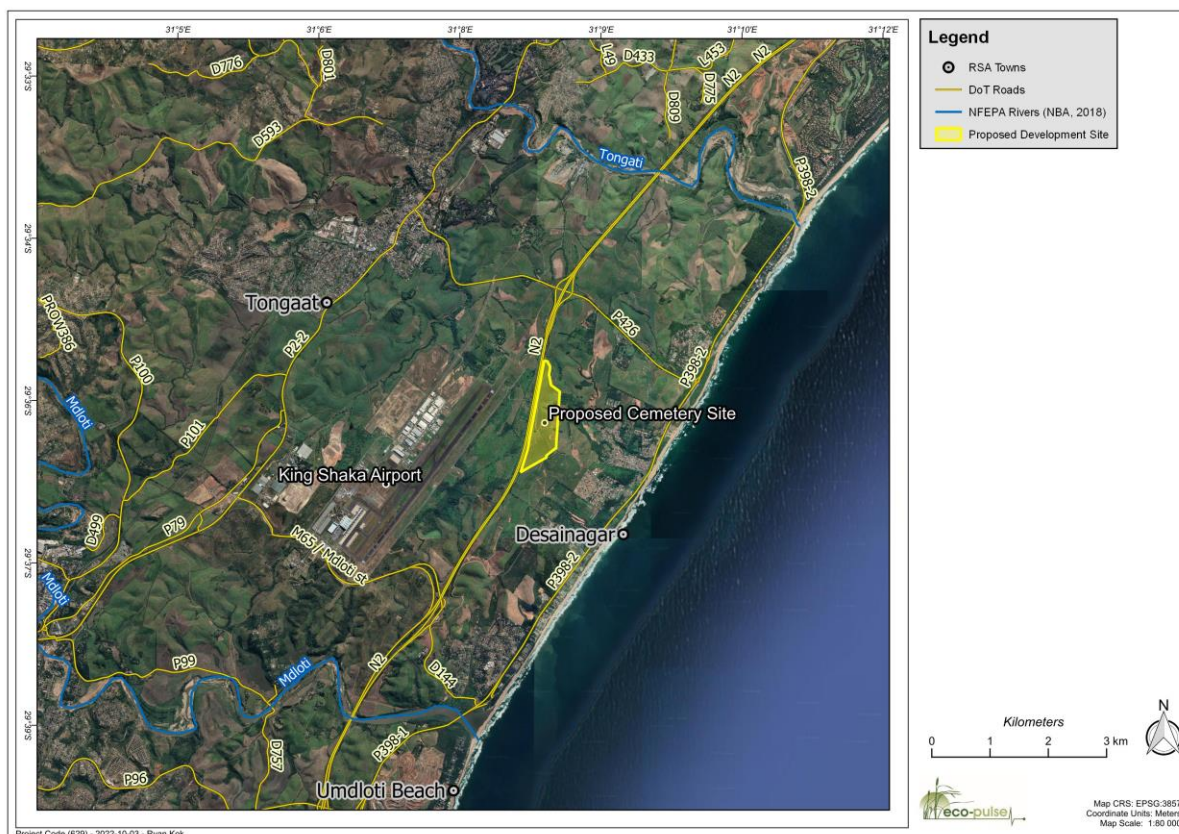


Figure 3: Locality Map (Relative Location)

The LMMP will be privately owned by Tongaat Hulett Property. The 61ha project site will be developed to include a cemetery with 33 838 grave sites categorised into Silver, Gold and Platinum; Chapels; Interfaith Halls; Canteen; Service Buildings; Memorial Trees; Columbarium Terrace; a wall of remembrance; parking; a Low Volume Domestic Sewage Treatment System; Gardens; Ablution facilities; and Staff Cottages.

1.2 Legal Requirements as per Appendix 1 of EIA Regulations, 2014 (as amended)

This Chapter of the BAR has been prepared in accordance with Appendix 1 of EIA Regulations of 2014 (as amended) and includes the information relevant information as shown in Table 2 below.

Table 2: Requirements set under Appendix 4 of EIA Regulations of 2014 (as amended)

Requirement	Relevant Section of this BAR
An EMPr must comply with section 24N of the Act and include --	

(a) details of- (i) the EAP who prepared the EMP; and (ii) the expertise of that EAP to prepare an EMP, including a curriculum vitae	Refer to Section 3 for EAP details and expertise and Appendix 3 for EAP CV.
(b) a detailed description of the aspects of the activity that are covered by the EMP as identified by the project description	Refer to Section 3.
(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.	To be included in final EMP.
(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; (v) where relevant, operation activities	Refer to Table 13 to Table 17 of Section 8.
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Refer to Table 13 to Table 17 of Section 8.

(ii) comply with any prescribed environmental management standards and practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable	
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f)	Refer to Section 9.
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f)	Refer to Table 13 to Table 17 of Section 8.
(i) an indication of the persons who will be responsible for the implementation of the impact management actions	Refer to Section 6 and Table 13 to Table 17 of Section 8.
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented	Refer to Table 13 to Table 17 of Section 8.
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f)	Refer to Section 10.
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Refer to Section 10.
(m) an environmental awareness plan describing 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 (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment	Refer to Section 9.
(n) any specific information that may be required by the competent authority	N/A

To meet the requirement set out under Appendix 4 of the EIA regulations, **Table 3** below illustrated the structure of this Environmental Management Programme (EMPr).

Table 3: Structure of the Report

No	Chapter Title	Contents of the Chapter
1	Introduction	This section provides background of the proposed LMMP and the BA process.
2	Project Description	This section provides a description of the proposed project scope, need and desirability, and project alternatives.
3	Legislative Framework	This section provides a list of all legislation, policies and/or guidelines of any sphere of government and the applicability to the application as contemplated in the EIA regulation, along with the listed activities triggering licensing requirements.
4	Public Participation Process	This section describes the Public Participation Process (PPP) followed to date and addresses planned PPP.
5	Description of the Site	This section provides an overview of the affected biophysical and social economic environment in the La Mercy area.
6	Environmental Sensitivity – Specialist Recommendations	This section provides a summary of the specialist recommendations on the proposed LMMP.
7	Environmental Impact Assessment	This section describes the impact methodology and the potential positive and negative environmental and social impacts of the proposed LMMP.
8	Conclusions and Recommendations	This section provides the conclusions and recommendations based on the findings of the BAR.

1.3 Applicant Details

Name of applicant:	Tongaat Hulett Property
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1.4 Aims and objectives the EMPr

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. The purpose of this EMPr is to provide an easily interpreted reference document that ensures that the project's environmental commitments, safeguards and mitigation measures from the environmental planning documents, project approvals and scope of works are implemented. It aims to minimise impacts associated with the proposed development. This includes ensuring that the mitigation measures described in the Basic Assessment Report are implemented, to ensure continued monitoring of the construction and operational phase and to ensure the involvement of interested and affected parties (IA&Ps) in a meaningful way. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, pre – construction, construction, operational and rehabilitation phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

The objectives for the EMPr are:

- To develop, implement and maintain effective management systems for the environmental aspects of the maintenance works;
- To document details of environmental protection infrastructure and controls so that they are able to provide long term protection for the natural environment;
- To ensure compliance with relevant legislation (National, Provincial and Local), regulatory requirements and environmental documents;
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects;
- To ensure that all Environmental Management considerations are implemented during the operational and maintenance phases of the project.

All the environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

1.5 Specialist's Studies

The EMPr has been developed based on the findings of the on-site assessment undertaken by NFZ Environmentals and the following specialist studies undertaken during the basic assessment process of this project:

Table 4: Specialist Studies commissioned for LLMP Basic Assessment Process

Specialist	Specialist Report	Date
Eco-Pulse Environmental Consulting Services	Freshwater Impact Assessment	October 2022
SLR Consulting (South Africa) (Pty) Ltd	Aquatic Assessment	August 2022
Kinvig & Associates	Ecological Assessment	March 2018
	Statement of Validity	October 2022
Mottram and Associates cc	Agricultural Potential Assessment	April 2018
Albert van Jaarsveld	Heritage Impact Assessment	June 2015
Umlando: Archaeological Surveys and Heritage Management	Heritage and Palaeontological Exemption Letter	August 2022
Umlando: Archaeological Tourism & Resource Management	Archaeological Statement of Validity	October 2022
Urban Econ	Socio-Economic Impact Assessment	September 2022
Nako Systra	Traffic Impact Assessment	September 2022
SLR Consulting	Hydrology Assessment (Floodline)	October 2022
EngeoLab	Geohydrology Study	October 2022
Drennan Maud (Pty) Ltd	Geotechnical Assessment	February 2015
Adamastor	Electrical Engineering Report	February 2022
Nako Group	Civil Engineering Services Report	September 2022
Rob Kirby & Associates	Town Planning Assessment	October 2022
Nako Group	Storm-Water Management	September 2022

2. ACTIVITY INFORMATION

2.1 Project Title

The Proposed Development of a Memorial Park in La Mercy, Tongaat, eThekweni Municipality, Kwazulu-Natal.

2.2 Architectural and Design Rationale

The La Mercy Memorial Park is the modern-day burial grounds with a difference. The design of this site is centred on creating an atmosphere that encourages reflection and remembrance. A space of natural beauty, peace for quiet meditation and a sense of dignity and honour to the memory of loved ones and an environment that serves as the backdrop to life celebration services.

The design includes the traditional cemetery ground spaces like delineated rows of burial plots with flat markers or upright monuments, cremation niches and columbaria and in addition, will also include more contemporary options like memorial benches, ash stones and memorial trees.

While the proposed La Mercy Memorial Park is a private development, it still has a vital role in the community and responds to a desperate need for quality facilities for end of life that provide a dignified and personalized final resting spot. As a non-denominational cemetery, the facility will serve families of all religions, cultures and backgrounds.

As articulated in the next section, various Chapels, Interfaith halls and Crematorium buildings in addition to the services building will be developed across the site. The architectural language together with the natural beauty of the park will create a distinguished ambience with the aesthetic characterised by simple contemporary shapes and patterns, an abundance of natural light, “truth to materials” and a focus of locally sourced products.

The design offers features like reflection pools, sculpture installations, and centres on the landscape design with a focus on the creation of points of biodiversity and the land being rehabilitated through the introduction of indigenous vegetation and trees. A space for the creation of new traditions, such as small gatherings in the heart of the park.

The proximity of the park to the King Shaka International Airport, the N2 and M4 make for easy access. It is intended that this development will be the catalyst for numerous projects and initiatives that will contribute to the preservation of the park and improvement of the local

community through the improvement of surrounding infrastructure, and encouragement of visitation to the site by locals and tourists alike.

The development of the grave and building platforms across the site has been carefully considered to correspond with the natural existing site topography. The linear shape of the site runs North to South with the N2 adjacent to the length of the Western boundary. Buildings have been concentrated to designated areas to reduce the impact of infrastructure and services provisions across the site while maximising the use of the elevation at the highest points on the site to maximise views to the ocean from the Chapels, Interfaith halls and open park areas.

The grave platforms are designed to a 9% slope throughout the site with the short end of all plots orientated perpendicular to the direction of the slope. The steep existing slope on the Eastern portion of the site will be engineered to balance cut and fill to achieve the required maximum slopes for grave layouts, internal service roads and public gardens and walkways.

Stormwater management interventions include a large natural attenuation pond at the lowest point on the Northeastern corner of the site while the provision of a sewer treatment plant and bulk water storage and pump provisions will ensure that there is no burden imposed on the existing municipal infrastructure or surrounding communities and will ensure sustainable management and operation of services going forward.

2.3 Project Description

2.3.1 Brief overview of Key Project Components

Tongaat Hulett Property is proposing the development and operation of the La Mercy Memorial Park (LMMP) within the eThekweni Municipality in Kwa-Zulu Natal Province. The LMMP will be privately owned by Tongaat Hulett Property. The 61ha project site will be developed to include the following:

- A cemetery with 33 838 grave sites categorised into Silver, Gold and Platinum. The three grave site categorisations (section) are detailed below:
 - Silver Grave Plots – This section comprises of 16 750 grave plots. Each grave plot will be 2.4m in length and 1.1m in width with 0.5m spacing between grave plots and 0.9m spacing between rows. Each grave will have a headstone and some plants just below the headstone. The pathways between the graves will be covered with lawn and be landscaped with trees. The proposed layout and design of the Silver Grave Plots are depicted in Figure 4 and Figure 5 respectively.

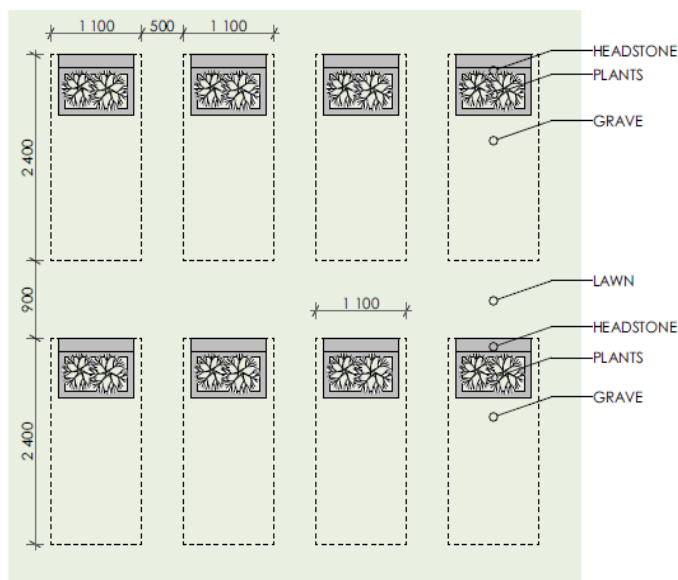


Figure 4: Silver Grave Plots Layout

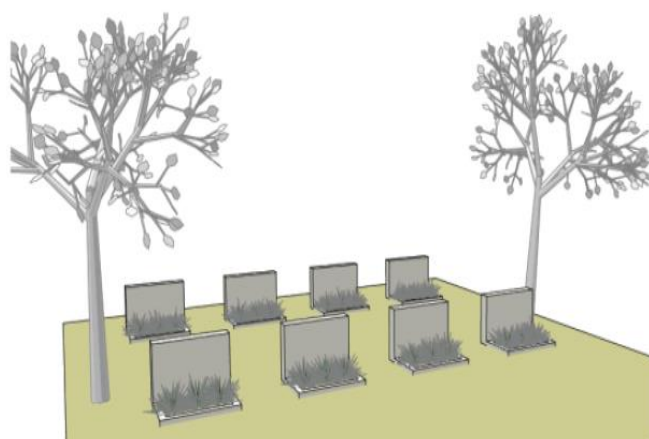


Figure 5: Silver Grave Plots Design

- Gold Grave Plots – This section comprises of 10 920 grave plots. Each grave plot will be 2.4m in length and 1.1m in width with 0.8m spacing between grave plots and 1.3m spacing between rows. Each grave will have a headstone, kerbing and will be covered with lawn. The pathways between the graves will be covered with gravel stones and be landscaped with trees. The proposed layout and design of the Gold Grave Plots are depicted in Figure 6 and Figure 7 respectively.

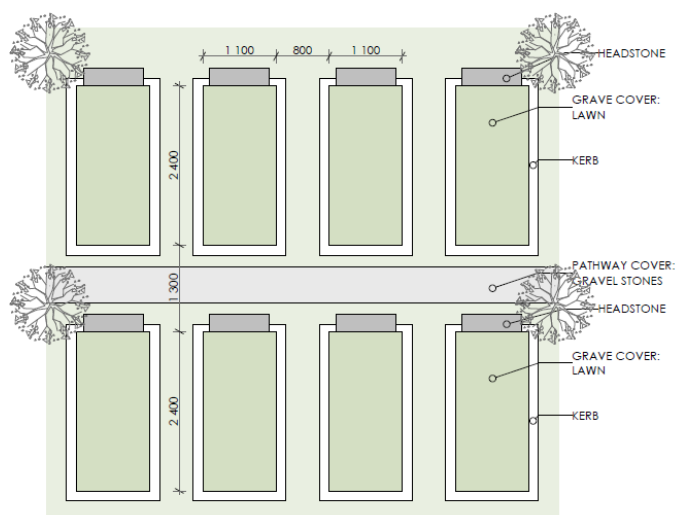


Figure 6: Gold Grave Plots Layout

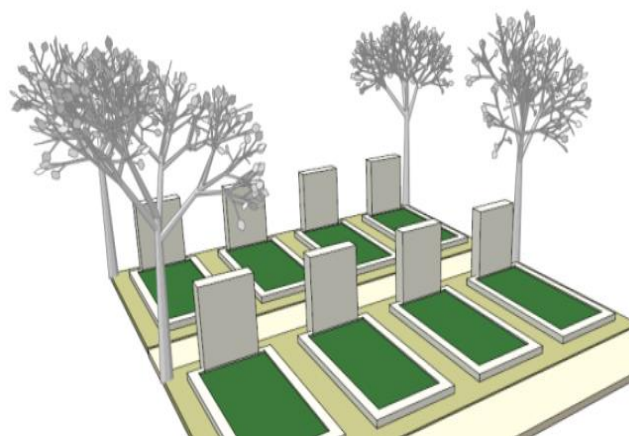


Figure 7: Gold Grave Plots Design

- Platinum Grave Plots – This section comprises of 6 168 grave plots. Each grave plot will be 2.55m in length and 1.1m in width with 1m spacing between grave plots and 1.35m spacing between rows. Each grave will have a headstone, plants and will be covered with a granite top or gravel. The pathways between the graves will be covered with low hedge plants, gravel stones, formalised pathways between rows and benches between graves, and will be landscaped with trees. The proposed layout and design of the Platinum Grave Plots are depicted in Figure 8 and Figure 9 respectively.

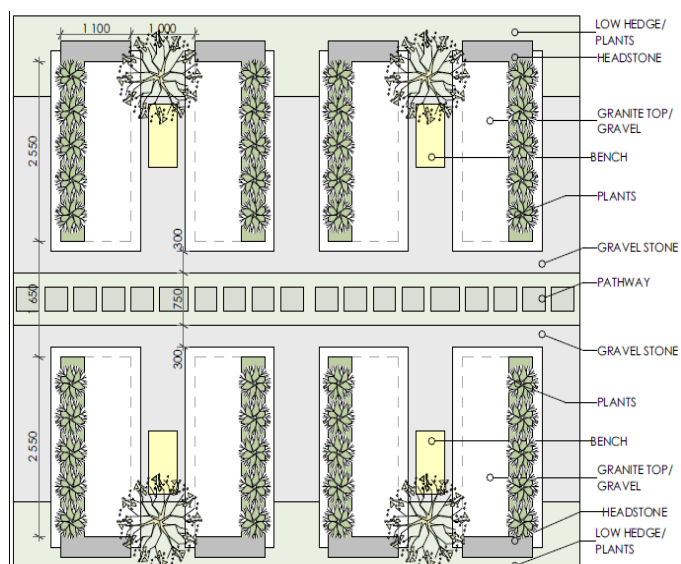


Figure 8: Platinum Grave Plots Layout



Figure 9: Platinum Grave Plots Design

- 3 Chapels – 1 platinum, 1 gold, 1 silver, 435m² each;
- 3 Interfaith Halls – per grave site categorisation, 740m² each;
- 3 Crematoria comprising of 2 cremation halls each – per section, 640m² each;
- Administration Building – 1176m²;
- Canteen – 297m²;
- Service Buildings – 1380m²;
- Memorial Trees – 430 large trees and a number of smaller trees (yet to be confirmed);
- Columbarium Terrace – four boxes/ linear;
- A wall of remembrance;
- An ashstone garden – 2700 ashstones;
- Parking – 1 334 parking bays (5.5x2.5m each) and 6 bus parking bays (17x4m each);
- Sewer Pump Station – 896m²;
- Gardens;

- Ablution facilities; and
- Staff Cottages.

These are depicted holistically in the Site Development Plan below (Figure 10)¹.

This Basic Assessment process entails the permitting process for the construction and operation of the cemetery, chapels, interfaith halls, admin building, canteen, service buildings, memorial trees, columbarium terrace, wall of remembrance, parking, garden, ablution facilities, staff cottages, sewer pump station and bulk services; excluding the crematoria and ash garden which will be applied for separately by means of a Full Scoping/EIA process.

¹ Subject to final design and may increase to 10%



2.4 Civil Engineering Services required for the development of the LLMP

2.4.1 Bulk Water Infrastructure

The area surrounding the proposed development is supplied with water by the La Mercy Reservoir which is located adjacent to the proposed development as indicated on Figure 10 above. The La Mercy Reservoir is currently owned and operated by uMgeni water. Through engagement with uMgeni water, the following operational information was obtained.

Table 5: La Mercy Reservoir Capacity

La Mercy Reservoir			
Storage capacity (MI/d)	Current Demand (MI/d)	Available Capacity (MI/d)	TWL
5	4.075	0.925	156m

The existing supply main to the reservoir is a 450mm diameter steel rising main which is routed parallel to the site on the eastern boundary within a pipeline servitude. There are no existing reticulation pipelines within the site boundary.

2.4.1.1 Design Requirements

The Guidelines for the Human Settlement and Planning Design (Red Book) has been used to quantify the design parameters as set out in Table 6 below.

Table 6: Water Design Parameters

Losses	25%
Peak Factor	3 (Applied to staff living cluster)
Velocity	Average: 0.9m/s
Chapels	2000 litre/d/erf
Shops	400 litre/d/100m ²
Staff Living Clusters	150 litre/occupant/d
Canteen	25litre/patron/d
Admin Reception	400 litre/d/100m ²
Halls	65l/seat/d

2.4.1.2 Assumptions

The design of the fire infrastructure including downstream pipework from the ring mains, hose reels, hydrants and other fire equipment inside and outside the buildings is the responsibility of the appointed Mechanical Engineer. The following criteria were used for fire:

- Two fire hydrants must be able to discharge simultaneously at a flow rate of 20 l/s (1200 litres/ minute) each for 60 minutes.
- Two fire hose reels must be able to discharge simultaneously at a flowrate of 0.5 l/s (30 litres/ minute) each for 60 minutes.

The expected Water demand for this proposed development is shown in Table 7 below.

Table 7: Expected Water Demand

Facilities	Users	Building Area (m ²)	Staff living clusters (Occupant) (l/day)	Stores 100 m ² (l/day)	W/Shops 100 m ² (l/day)	Admin/Reception (100 m ²) (l/day)	Halls (l/seat/day)	Chapels (Erf) (l/day)	Canteen (l/patron)	Proposed Annual Demand (l/day)	Proposed Peak Demand (l/day)	Proposed Peak Demand (25%) Loss (l/day)
			150	400	400	400	65	2000	20			
Staff living cluster	6		1800							1800	19800	23760
Stores		431		1724						1724	1724	2069
W/Shops		431			1724					1724	1724	2069
Admin/ Reception		2035				8139				8139	8129	9767
Inter-Faith Halls	200						39000			39000	39000	46800
Chapels								12000		12000	12000	14400
Canteen	50								1000	1000	1000	1200
Total		2897	1800	1724	1724	8139		12000		65387	83387	98864

Fire Demand		
Hosereels	30	l/min
Hydrant fire flow	1500	l/min
No of hydrants and hoses	2	
Duration of fire flow	60	min
Fireflow	183600	l/d
	0,1836	ML/day

The total annual daily demand (domestic and fire) is 0.248 ML/day and the Storage capacity for 48hrs is **0.5 M**.

2.4.1.3 Proposed Infrastructure

2.4.1.3.1 Bulk Water Infrastructure

The existing 450mm diameter steel supply main to the existing 5ML La Mercy Reservoir is adequately sized to supply the existing demand from the residential area and proposed demand from the memorial park development.

Through engagement with Umgeni Water officials, it was verified that the existing 5ML La Mercy Reservoir does not cater for fire water storage and a storage capacity of 48 hours. Therefore, the existing water storage facility does not comply with the requirements of eThekweni Municipality.

It is recommended the following bulk infrastructure be constructed to provide storage and supply to the proposed memorial park development and meet the requirements of the local authority:

- New 1ML ground water tank adjacent to the existing reservoir to provide supply for firefighting and domestic supply
- Inlet pipeline from the existing 450mm diameter steel rising main to the new 1ML ground water tank.
- Booster Pumpstation – Due to insufficient available static head between the proposed water storage facility and the facilities on the site, a booster pump station is required to ensure sufficient residual pressures in both the domestic and fire water distribution pipe networks.

2.4.1.3.2 Internal Infrastructure

- Construction of a network of rising mains and reticulation pipelines to supply water (domestic and fire) to the various facilities.
- Construction of valves and fire hydrants – All valves, fittings and chambers are designed according to SANS 1200L and all other standards referred to in SANS 1200L. Fire Hydrants will be placed at a minimum 180m apart and as per eThekweni Standard details.
- Construction of a water meter.

2.4.2 Bulk Sewer Infrastructure

The site has a natural westward drainage and northwards. The lowest of the site is the north-eastern corner where the sewer from the development can be collected.

The proposed site neighbours the residential area of Desainager, which is currently serviced by a network of sewer pipelines. According to the GIS data, all wastewater from the Desainager area discharges into the Genezzano Wastewater Treatment Works (WWTW). The conveyance and the treatment of wastewater from this area is the responsibility of the eThekwini Municipality.

2.4.2.1 Design Requirements

The Guidelines for the Human Settlement and Planning Design (Red Book) and the eThekwini guidelines for the design of foul – water sewers were used to quantify the design parameters as shown in Table 8.

Table 8: Sewer Design Parameters

Infiltration	15%
Peak Factor	2.5 (Applied to staff living cluster)
Pipe Grade	Minimum Grade: 1:200 (eThekwini Guidelines Pg.5)
Velocity	Minimum Velocity: 0.66m ³ /s
Chapel	1600 litre/d/erf
Staff Living Clusters	120 litre/occupant/d
Shops	320 litre/d/100m ²
Admin Reception	320 litre/d/100m ²
Canteen	20l/patron/day

The expected sewer flows for this proposed development are shown in the Table 9.

Table 9: Expected Sewer Flows

Facilities	Users	Building Area (m ²)	Staff living clusters (Occupant) (l/day)	Stores 100 m ² (l/day)	W/Shops 100 m ² (l/day)	Admin/Reception (100 m ²) (l/day)	Halls (l/seat/day)	Chapels (Erf) (l/day)	Canteen (l/patron/day)	Proposed Average Daily Flow (l/day)	Proposed Peak WW Flows (l/day)
			120	320	320	320	52	1600	20		
Staff living cluster	6		1400							1656	4140
Stores		431		1379						1586	1586
W/Shops		431			1379					1586	1586
Admin/ Reception		2035				6511				7488	7488
Inter-Faith Halls	200						31200			35880	35880
Chapels								9600		11040	11040
Canteen	50								1000	1000	1000
Total		2897	1400	1379	1379	6511		9600		60236,48	61720,48

The Proposed Annual Average Flow is 60.23 kl/day and the Proposed Annual Peak Flow is 61.72 kl/day.

2.4.2.2 Recommendation Options

2.4.2.2.1 Bulk Infrastructure

Three options were considered for the treatment of wastewater from the proposed La Mercy Memorial Park:

- Option 1 – Genazzano WWTW
- Option 2 – Septic Tank and Soakaway System
- Option 3 – Privately Owned Low Volume Domestic Sewage Treatment System (Recommended)

These are discussed in detail in the Alternatives section (Section 2.5).

2.4.2.2.2 Internal Infrastructure

It is proposed that a series of UPVC Class 34 gravity sewer pipelines (minimum diameter – 160mm) be constructed to discharge the flows from each facility to the proposed on-site treatment plant.

It is noted that the Northeastern corner, where staff quarters and workshops are located, will require a mini pump station to lift the effluent to an level or elevation over the adjacent ridge, whereby the effluent can drain by gravity to the proposed on-site treatment plant.

Figure 11 depicts the sewer plan layout which shows the location of the Low Volume Domestic Sewage Treatment System. Figure 12 indicates the proposed location of the mini pump station location.

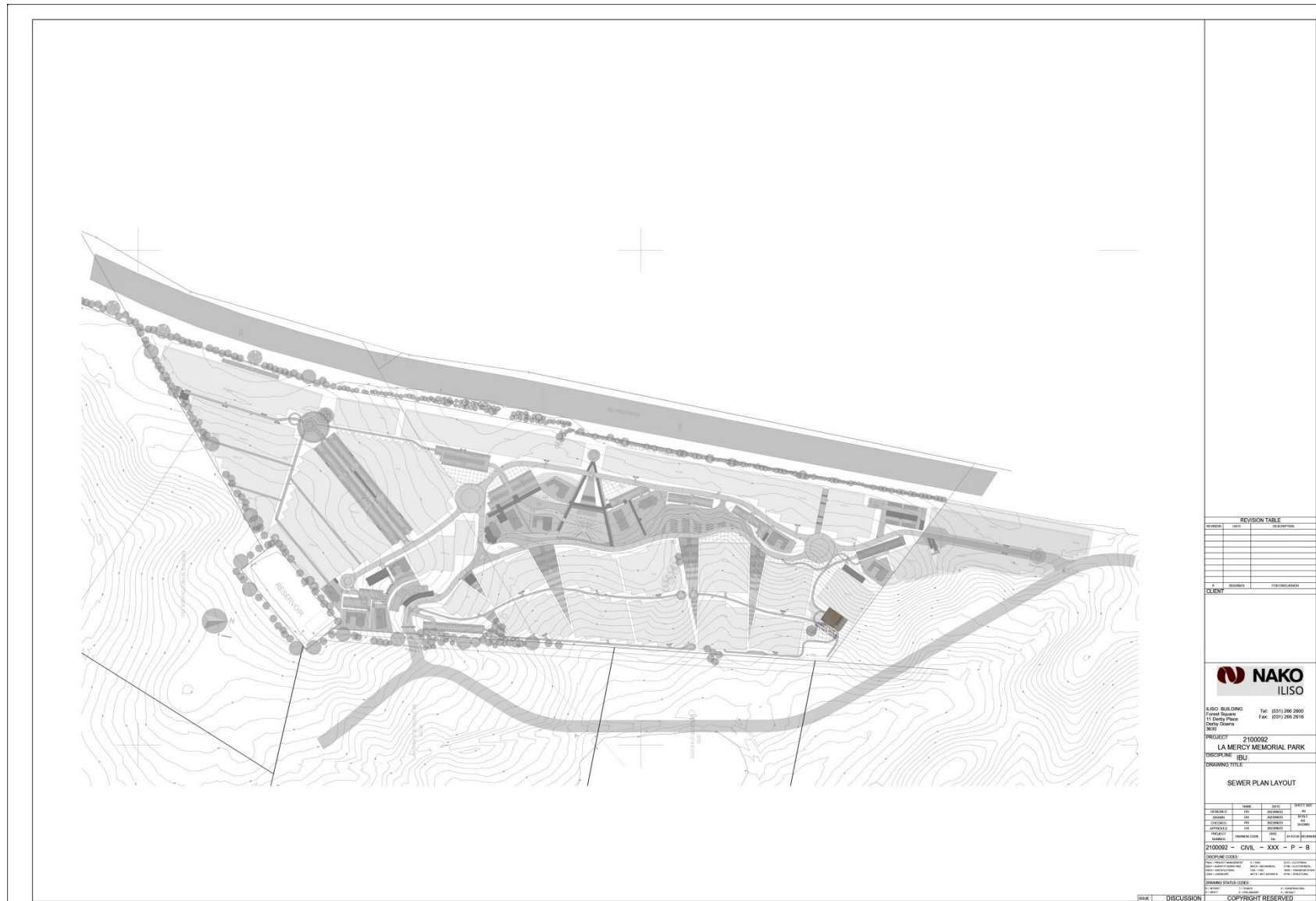


Figure 11: Sewer Plan Layout

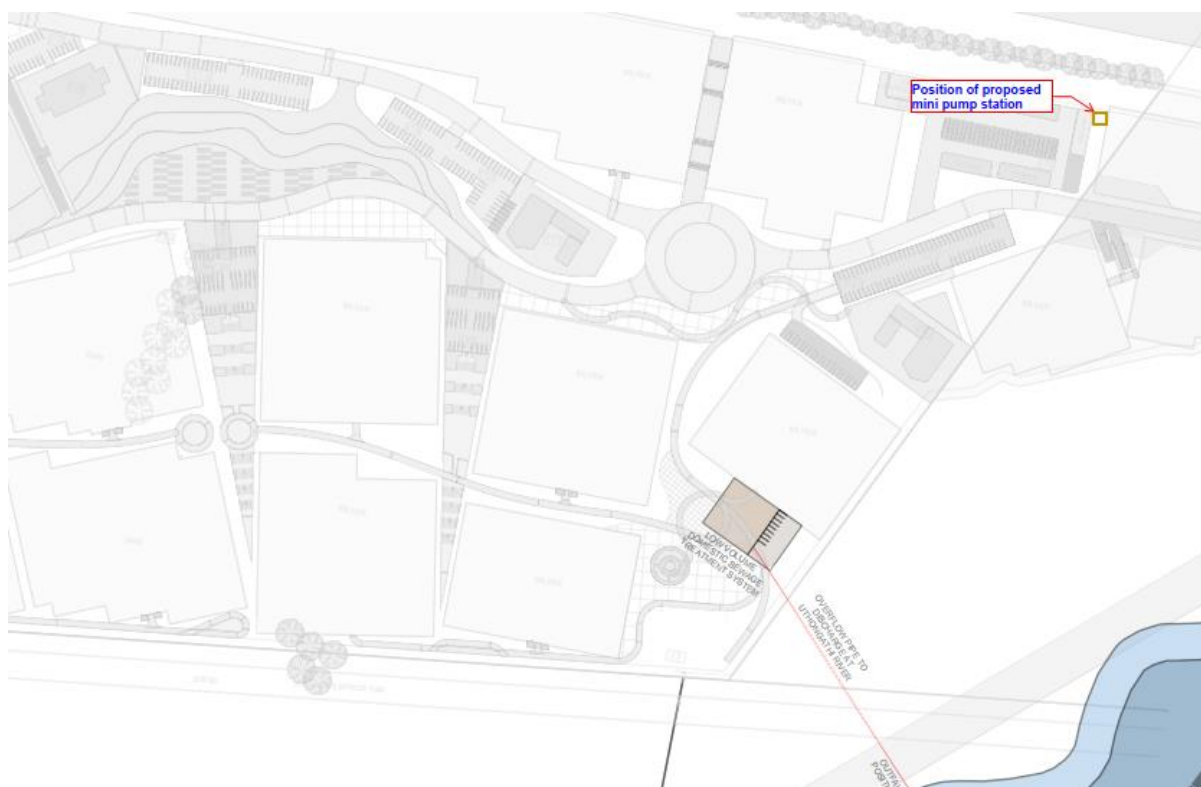


Figure 12: Mini Pump Station Location

2.4.3 Roads

2.4.3.1 Geometric Design Standards

The eThekweni Municipality design standards and UTG3 “Structural Design of Urban Roads – 1998” road classification guidelines have been used for planning purposes. A design speed of 60km/h has been adopted for Option 3B and 40km/h for Option 1, Option 2 and Option 3A.

The applicable standards which were adapted are as follows:

Table 10: Applicable Standards

	Option 1	Option 2	Option 3	
			A	B
Design Speed (km/h)	40	40	40	60
Minimum horizontal design curve radius (m)	75	75	75	150
Superelevation: e _{max} (%)	4	4	4	6
Stopping Sight Distance (m)	45	45	45	85
Minimum (Desirable) Longitudinal Gradient	0.5	0.5	0.5	0.5
K-Vertical Crest (0,66m object height)	3.1	3.1	3.1	5.0
K-Vertical Sag (headlight illumination)	1.85	1.85	1.85	1.85

2.4.3.2 Route Descriptions

Four route options (1, 2, 3A and 3B) were proposed in the Traffic Impact Assessment produced by Nako SYSTRA. All routes have been assessed using the above-mentioned design standards.

These are discussed in detail in the Alternatives section (Section 2.5).

2.4.4 Electrical Infrastructure

2.4.4.1 Current Infrastructure

eThekwini Electricity has an 11kV and 400-volt network in the adjacent area to the proposed cemetery site, i.e., Genazzano and Desainer. These areas are reticulated with either overhead bundle conductors (points A, B and C in Figure 13) or underground cables. These residential areas are not fully developed and as such eThekwini Electricity have indicated that they will have sufficient capacity in the area to supply the cemetery site. The developer of the site would have to apply for a connection to his site through the normal eThekwini Electricity application process. eThekwini Electricity have subsequently identified another point of supply. This point is approximately 850m from the site; however the point of supply is west of the N2.



Figure 13: Electrical Infrastructure

2.4.4.2 Infrastructure

In order to provide the proposed cemetery with a point of supply, eThekweni Electricity will either run with and an 11kV bundle conductor from Crawford Collage, position A or position B as indicated in Figure 13. The actual take-off position will be determined by eThekweni Electricity at the time of application, after considering a number of technical factors. The overhead bundle conductor will generally follow road reserves to the proposed cemetery positions.

In terms of the requirements for a basic assessment for environmental approval, an electrical servitude will not be required to be registered, i.e., 275 kV and above.

Due to the position of the proposed cemetery in relation to Crawford Collage and the existing residential areas Genazzano and Desainager, electricity can be supplied to the cemetery site. The existing network can be extended to accommodate this relatively small electrical load without having to upgrade the network capacity.

It is recommended that PV panels be investigated and considered for this project.

2.4.5 Stormwater Management

Due to the close proximity of the site to the wetland along the northern boundary, it is proposed that the stormwater management system for the site consist of a predominantly Sustainable Urban Drainage Solutions (SuDS) approach in combination with conventional (harder engineered) stormwater solutions. In adopting SuDS solutions the impact of the development in terms of runoff to the receiving environment and in particular, to the nearby wetland will be largely mitigated.

The following stormwater infrastructure components are proposed to manage the stormwater runoff generated as a result of the construction of the memorial park.

- Swales

Vegetated swales collect water from hard surfaces and allow it to infiltrate into the ground, thereby attenuating the runoff peak generated on hardened surfaces. Vegetation in the swale also traps sediment generated from the site, and reduces the velocity of post development flows.

It is subsequently proposed that two swales be constructed along the western and eastern boundaries of the site. These will act as the major collectors of the site.

- Cut-off drains, grassed lined channels, grid inlets, subsoil drainages
 - Cut-off drains will be placed along the cut banks and grassed lined channels are proposed adjacent to the internal roads.

- Runoff from the parking areas and buildings will be discharged into grid inlets and conveyed into the minor system via pipelines and concrete lined channels.
 - Subsoil drainage is proposed along all retaining walls.
- Attenuation

One attenuation pond (45m x 45m x 6m) is proposed on the north-eastern corner of the site. The purpose of this pond, together with the abovementioned SuDS infrastructure (i.e. swale along the western boundary of the site and grass lined channels) is to attenuate the post development runoff peak of the site to that of the pre-development condition. It is proposed that a SuDS philosophy be applied to this pond such that it mimics a wetland in which water quality is maintained and ecological enhancements can be achieved. Flow from this pond will be discharged, at a pre-development rate, into the existing wetlands outside the site boundaries.

The purpose of the attenuation is to ensure that the runoff from the developed site is no larger than that of the site in its current undeveloped state, and therefore any runoff impact on the receiving environment due to the development is mitigated.

The purpose of the attenuation is to ensure that the runoff from the developed site is no larger than that of the site in its current undeveloped state, and therefore any runoff impact on the receiving environment due to the development is mitigated.

The stormwater management layout plan is depicted in Figure 14 below.

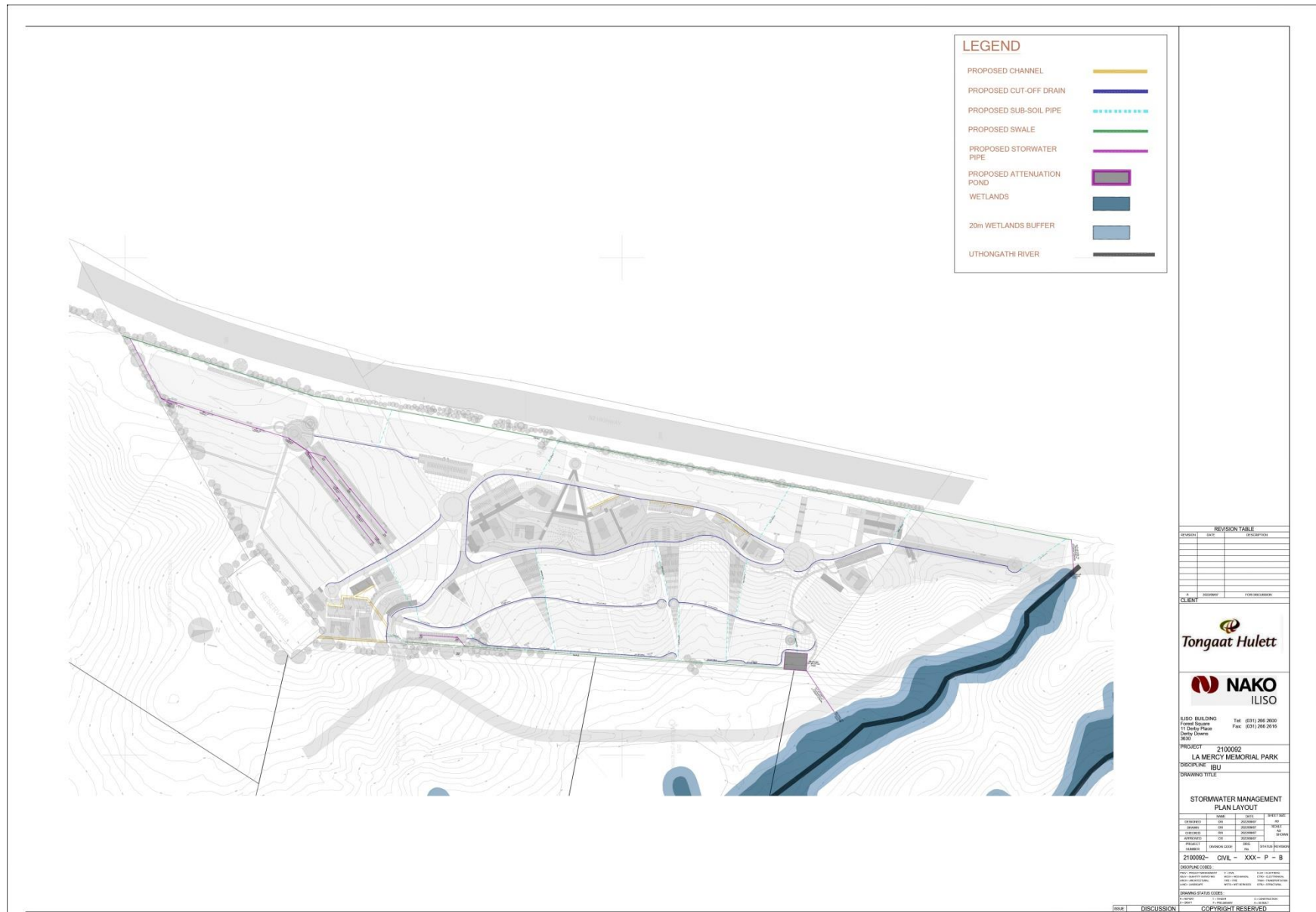


Figure 14: Stormwater Management Plan

2.5 Description of Alternatives

Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. A number of alternatives have been considered for the proposed LMMP. These are discussed in Table 11.

The following fundamental aspects were considered for the alternatives:

- Extent
- Capacity
- Durability, Serviceability and Sustainability
- Economy
- Constructability
- Aesthetics
- Environmentally sensitive area i.e. the wetland area to the north

Table 11: Alternatives Description

Alternative Type	Alternatives Description
1. Site Development Plan (SDP)	SDP Option 1 (Preferred) This layout has a larger development area which maximizes the space for the LMMP. This SDP yields 33 838 graves.
	SDP Option 2 This SDP included all the amenities proposed in SDP Option 1, with some areas refined due to a number of restrictions imposed by various elements which reduced the grave yield of the Memorial Park.
2. Bulk Sewer Infrastructure	Option 1 – Genazzano WWTW This option entails flow of sewer in to the existing conventional gravity sewer system to discharge into the existing Genazzano WWTW. However, the WWTW does not have sufficient capacity

	for the LMMP.
	<p>Option 2 – Septic Tank and Soakaway System</p> <p>The Septic Tank Size would be 8m wide x 22m long x 2.5m deep and the Soakaway Length would be 140m which is a large extent of land. Furthermore, the percolation test indicates that the soils within the site are highly permeable which can result in contamination of the wetland and watercourse located +/- 140m from the site.</p>
	<p>Option 3 – Privately Owned Low Volume Domestic Sewage Treatment System (Preferred)</p> <p>This option is preferred as is it independent from municipal infrastructure, preserves surface and underground water, provides sufficient capacity to cater to the LMMP, it allows the reclamation and treatment of effluent waste to be reused thus saving up to 60%, it is odourless and requires a smaller extent of land.</p>
3. Access Roads²	<p>Option 1 – Access Off Park Avenue (Extension) (Preferred)</p> <p>Park Avenue currently intersects with the M4 (P398-2) at a traffic circle. This option is to extend Park Avenue westward to the site.</p>
	<p>Option 2 – New Road Off Watson Highway</p> <p>This option entails the formalization of an existing gravel road that intersects with Watson Highway (P426) to provide access to the site.</p>
	<p>Option 3A – From M4 (P398-2) re-alignment intersection along new route</p> <p>This option will allow for direct access off Watson Highway (P426) at the realigned M4/Watson Highway intersection, along a new route due to inter alia earthworks and cost considerations.</p>
	<p>Option 3B – Along M4 (P398-2) Re-alignment route</p>

² It must be stressed that these access proposals are of an interim nature and are superseded upon implementation of the M4 (P398-2) realignment.

	<p>This option is along the M4 (P398-2) realignment corridor, which in the short-term would consist of constructing one half of the proposed M4 (P398-2) carriageway, viz. two lanes, which would function as a bi-directional two-lane road to serve as access to the development.</p>
4. New Roads and Widening	<p>Option 1 – New Road and Widening (Preferred)</p> <p>In order to service the proposed memorial park site an extension of Park Avenue is required which will extend through to the proposed memorial park site access. The extended Park Avenue requires a configuration such as a two-way two-lane road with 3,65 metres lane widths. The ninety-degree curve should have a minimum radius of twenty metres to accommodate the movement of buses.</p>
	<p>Option 2 – New Road</p> <p>This option requires a configuration that is a two-way two-lane road with 3,65 metres lane widths including channel.</p>
	<p>Option 3 – New Road</p> <p>This option requires a configuration that is a two-way two-lane road with 3,65 metres lane widths including channel for the internal road network. The configuration along the M4 (P398-2) is such that it is a two-way two-lane road with 3,70 metre lane widths including channel since this is aligned to the standard guidelines.</p>

2.6 Need and Desirability

There has been a dire need for additional cemetery development for several years in Durban and the surrounding areas. Within the eThekweni Metropolitan region, there are 65 graveyards with a total of 550 000 sites for interment. Many of these are close to reaching full capacity, despite the fact that up to three bodies are buried in the same site. The Queensburgh Cemetery located 16.5 kilometres from the city and the three cemeteries located within St Wendolins Mission are all full and cannot accept any more burials. The demand for graves was exacerbated by the impact of the Covid 19 pandemic when the rate of monthly burials increased from 700 to 3 000 people in 2021. Whereas in eThekweni, there were 5, 648 Covid deaths recorded. The rate of death increased by 40% per month within eThekweni Metropolitan Municipality resulting in the need to bury up to three corpses in one grave. This shortage of grave sites became so dire, that relatives resorted to burying bodies within roadways in existing but full cemeteries or attempting to have their loved ones transported for burial to rural areas. Public cemeteries have also become synonymous with being unsafe spaces or social facilities in part due to a lack of maintenance, but also due to opportunists' criminals choosing to attack and rob visitors to the graves. At that time, the Head of the Department of Parks, Recreation and Culture in eThekweni appealed to residents who had lost family and friends to consider other alternatives to burial since the pandemic placed the public cemetery system under severe strain. However, for many, cultural and religious belief systems do not allow for alternative methods e.g., cremation or biological disposal. During this time, eThekweni Municipality raised the provision of burial sites as a critical service for which provision must be made. Thus, the need for the development of new cemeteries is an urgent requirement for the city.

The proposed LMMP will address part of this need and allows the private sector to engage with development processes to supplement other initiatives launched by the city. The new cemetery will provide ±34 000 new burial plots together with family graves, memorial gardens, and walls. Three new crematoria will increase the capacity of the city to dispose of bodies and supplement the aging infrastructure for this purpose (excluded from this application).

Tongaat Hulett, through its engagements with the eThekweni Municipality identified the need for burial space was becoming a challenge for the City and it was agreed for Tongaat Hulett to identify suitable sites within its portfolio. This led to broad investigation that resulted in this particular site being identified as the most preferred. The series of studies conducted included the identification of suitable soils, terrain, accessibility and compatibility of land use

mix. A Market Study was also conducted to determine the type of burial will be in demand for this area given the demographics and current trends in the region.

The motivation for the proposed memorial park development is to relieve pressure on the city to provide cemetery space and burial sites for the increased population in the region. The eThekweni municipality population between the years 2020 and 2024 has been estimated to rise from about 4.07 million people to approximately 4 164 503 million people, respectively (eThekweni IDP, 2020). With this increase in population comes with it an extreme increase of deaths as well as an increase in the demand for grave sites; especially now more than ever due to the global pandemic. This project aims to provide the local community access to cemeteries, as well as ease the municipality's increasing struggle to meet these grave site demands.

Through the Kwa-Zulu Natal Cemeteries and Crematoria Act, No. 12 of 1996 the eThekweni Municipality reserved suitable municipality land for establishing and managing cemeteries and crematoriums. However, the reality of the city's cemeteries is that they are overcrowded, full or close to reaching their capacity. The need for additional burial space has become a necessity. Over the years, finding burial land has proved to be a difficult task for the eThekweni's local community, which is why the eThekweni Municipality has outlined the growing need for the city to identify land that can be reserved and used for cemeteries in the city's future development. As such, the eThekweni Municipality's 2017 SDP made plans to re-engage with stakeholders to tackle the burial space shortage and considers applications for the establishments of public and private cemeteries under special conditions and by-laws. With this, the proposed development sets out to ease some of the municipal's burial space concerns and will provide a service especially to the communities within the region. However, both public and private cemeteries need to comply with the cemeteries, crematoria and undertakers' by-laws in terms of section 156(2) of the Constitution of the Republic of South Africa, 1996, read with section 11(3)(m) of the Local Government: Municipal Systems Act, No. 32 of 2000. The 61-hectar memorial park will provide 33 838 grave sites which all comply with the requirements of the eThekweni Municipality of 2.4m x 1.1m dimensions and 21 hectar.

Furthermore, the National Spatial Development Framework (NSDF) of 2020 addresses the national concern in inequality of access to social infrastructure to all South Africans. As such, the NSDF outlines the importance to providing accessibility of well planned, well-functioning and well managed urban and rural social amenities. This project aids this as it aims to provides burial land for South Africans as well as provide job opportunities to the locals.

The desirability of the site is that it is located within the proposed La Mercy Spatial Development Plan and forms part of the provision of social services needed together with the planned future residential areas outlined in the municipality's Spatial Development Framework (SDF). The topography of the site and its location allow it to be screened from the surrounding existing current and future residential development, road system, and the King Shaka International Airport. There are minimal environmental impacts related to the proposed cemetery use of the site which will be developed as a 'greenfield site' allowing the optimal use of landscaping and terracing in its design. Negative visual impacts will also be greatly reduced because of developing the site as a Memorial Park with extensive indigenous landscaping and special architectural "green" aesthetically pleasing architecture being applied to all buildings and aesthetic features not normally found or provided in a public cemetery.

The ability of the cemetery to utilise existing electricity, water provision and road network to their full extent and provide a private sewage package plant results in an excellent mix of private and public resources with the developers bearing the cost of all cost in constructing new infrastructure or upgrading the existing infrastructure.

2.7 Closure

The closure phase has not been considered as part of this application. The current environmental baseline conditions may change overtime; it is therefore not possible to predict the potential environmental impacts. When the graveyard reaches capacity, Tongaat Hulett Property will lodge a formal application with the Department of Arts and Culture to list the LMMP as a tourist attraction for KZN. It is envisaged that the park will remain open thus the LLMP will still be maintained in terms of landscaping, and infrastructure. However, if closure is considered in future, the developer/ license holder will undertake the required actions by applying for closure (separate EIA process).

3. PREPARATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

This Environmental Management Programme was compiled by:

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Expertise of Environmental Practitioner that prepared the EMPr

The Principle EAP of this EMPr, is a highly competent Environmental Consultant with more than 15 years' experience and advanced knowledge in the global environmental and engineering fields, predominantly in oil and gas, infrastructure development, industrial developments, minerals and metals. She has a successful track record in environmental permitting processes, managing specialists, project budgets, project management, conflict resolution, project administration, interfacing with other disciplines, environmental strategy and policy, environmental and related legislation (South African and international) and public participation processes. She has successfully led and contributed to ESIAs for large multi-disciplinary projects and accomplished in producing sound scientific reports that are understandable to non-technical stakeholders. She is a strong communicator with project and technical teams, client, authorities and public role-players.

4. DESCRIPTION OF THE IMPACTS

According to the KwaZulu-Natal Biodiversity Sector Plan, A small portion to the north-east of the site is located on an Irreplaceable Area as depicted in Figure 15 below.



Figure 15: KwaZulu-Natal Biodiversity Sector Plan Map

According to the wetland assessment, the proposed site is located in Quaternary Catchment U30D which falls within the Pongola-Mtamvuna Water Management Area (WMA). The study area is drained by small streams which do not connect with the main Tongati River and discharge directly into the Indian Ocean. Several wetlands were identified within the 500m DWS regulated area for wetland water use (Figure 16). No wetlands or watercourses were identified on the property and site of the planned development itself, with the nearest wetland located approximately 250m from the property boundary. The findings of the baseline wetland assessment revealed that the wetlands within close proximity to the site are currently in a degraded or 'poor' ecological condition with a Present Ecological Status (PES) of 'D' and an Ecological Importance and Sensitivity (EIS) of 'moderately-low' due to their degraded state, limited intact habitat and reduced level of wetland functioning (i.e. limited ecosystem services provision).

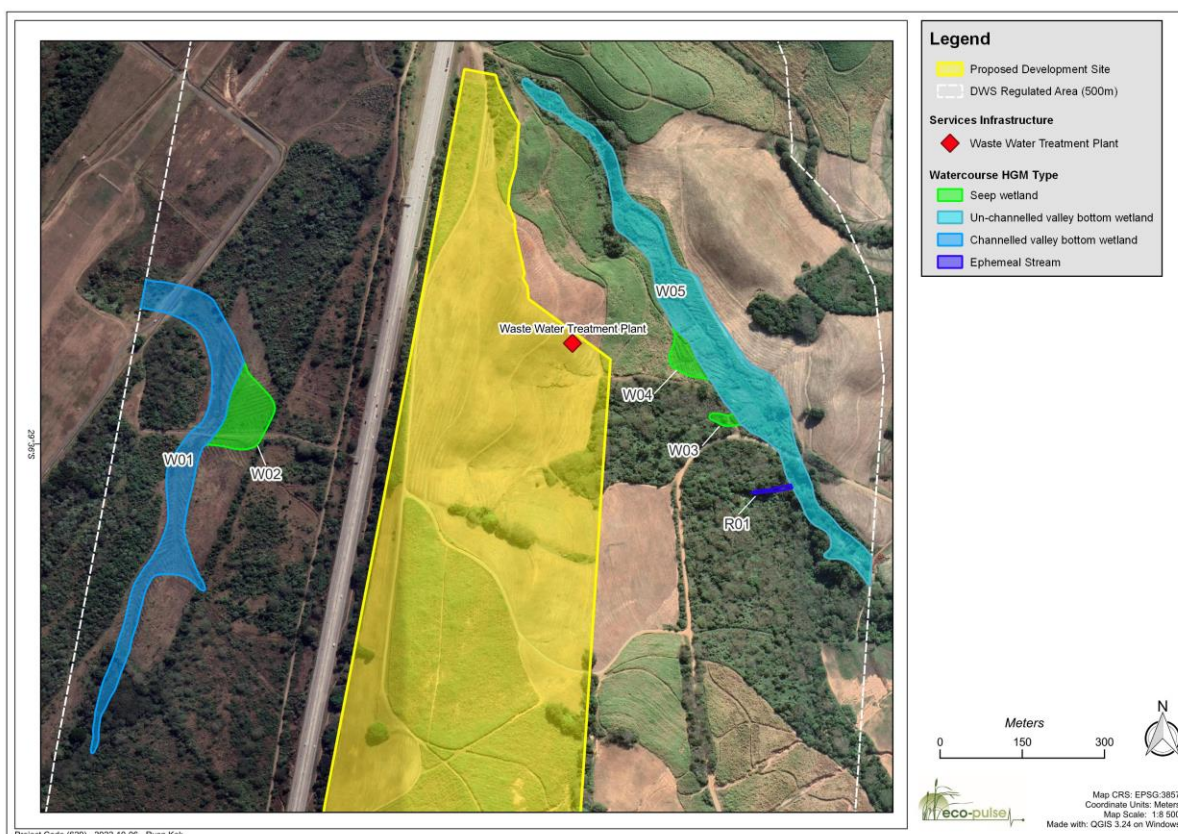


Figure 16: Wetland Delineation Map

Potential impacts that may occur during the construction will include soil erosion and sedimentation, surface water contamination due to hydrocarbon spillages from construction vehicles and machinery, noise, dust and traffic from construction equipment and vehicles. Waste management issues such as littering which can also cause visual nuisance. Traffic congestion in and around the area may offend neighbouring property owners during the construction phase. Local security is also likely to be comprised during the construction phase by the presence of workers on site. During operation, seepage is considered a risk.

It is thus of utmost importance that the mitigation measures proposed in this EMP be adopted and be monitored by an independent person throughout the construction and operational phases.

5. APPLICABLE LEGISLATION

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licenses that need to be obtained. This EMPr will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to proposed development.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all “actions” that they approve must be economically, socially and environmentally sustainable. It further states that “people and their needs” must be at the forefront of “its concern” and their interests must be served equitably. The intent of this EMPr is to ensure that the developer conducts all its activities related to the construction and maintenance of this erosion protection measure in accordance with the provisions of the NEMA, and has taken into account the provisions of the constitution and the principles of Integrated Environmental Management (IEM).

The legislative requirements include, but are not limited to, the following:

Table 12: Applicable Legislation

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
National Environmental Management Act (Act No. 107 of 1998)	NEMA requires, inter alia, that: <ul style="list-style-type: none"> Development must be socially, environmentally, and economically sustainable. 	National Department of Forestry, Fisheries and the Environment (DFFE)	The Basic Assessment is undertaken in accordance with the requirements of Government Notice R326 of April 2017, as required in

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	<ul style="list-style-type: none"> Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied. A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. <p>EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p>	KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA)	terms of the National Environmental Management, 1998 (Act No. 107 of 1998).
National	A project proponent is required to consider a project	National Department of	While no permitting or licensing


Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
Environmental Management Act (Act No. 107 of 1998)	<p>holistically and to consider the cumulative effect of potential impacts.</p> <p>In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.</p>	<p>Forestry, Fisheries and the Environment (DFFE)</p> <p>KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA)</p>	<p>requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the impact assessment phase.</p> <p>The implementation of mitigation measures is included as part of the Project EMPr and will continue to apply throughout the life cycle of the project.</p>
National Water Act (Act No. 36 of 1998)	<p>Section 21 water uses as per the NWA includes:</p> <p>21(a): Taking water from a water resource;</p> <p>21(b): Storing water;</p> <p>21(c): Impeding or diverting the flow of water in a watercourse;</p> <p>21(d): Engaging in a stream flow reduction activity;</p> <p>21(e): Engaging in a controlled activity;</p> <p>21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit;</p>	Department of Water and Sanitation (DWS)	<p>The proposed development requires a Water Use License as Section 21 c and i of the NWA are triggered as a result of the proximity to the wetland area. A Water Use License Application will be undertaken prior to the commencement of construction.</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	<p>21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;</p> <p>21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process;</p> <p>21(i): Altering the bed, banks, course or characteristics of a watercourse;</p> <p>21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and</p> <p>21(k): Using water for recreational purposes.</p> <p>For wetland areas, development within a 500m buffer triggers the act. For rivers, development within a 100m buffer triggers the act. Any activity that triggers any of the above water uses will require a Water Use License.</p> <p>Given the sensitivity associated with a project, DWS will determine whether the project will follow a General Authorisation process or a Water Use</p>		

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	License Application process.		
National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)	This Act provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act (Act No. 107 of 1998); the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.	National Department of Forestry, Fisheries and the Environment (DFFE)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project in proper management of the sensitive area (wetland) identified on site.
National Environmental Management: Waste Act (Act No. 59 of 2008)	The NEMA: WA came into effect on the on 1 st July 2009. Section 20 of the Environment Conservation Act (Act No. 73 of 1989), under which waste management was previously governed, was repealed. In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing.	National Department of Forestry, Fisheries and the Environment (DFFE) National Department of Forestry, Fisheries and the Environment (DFFE) – lead authority for regulating hazardous waste. KZN Department of	No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
		Economic Development, Tourism and Environmental Affairs (EDTEA) – for regulating general waste	
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<p>Section 18, 19 and 20 of the Act allow certain areas to be declared and managed as “priority areas”.</p> <p>The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</p> <p>Dust Control Regulation Control Regulations, R. No. 827 of 1 November 2013.</p>	<p>National Department of Forestry, Fisheries and the Environment (DFFE)</p> <p>eThekweni Local Municipality</p>	<p>This Act will find application during the construction of Phase 2 of the project; the crematoria and ash garden. This triggers the need for an Air Emissions License. This will be undertaken as a separate application as discussed with EDTEA in the pre-application meeting.</p> <p>The implementation of dust mitigation measures are included as part of the project EMP and will continue to apply throughout the life cycle of the project.</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
			Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.
National Heritage Resource Act, 1999 (Act No. 25 of 1999)	<p>Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length.</p> <p>In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.</p> <p>If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is</p>	<p>South African Heritage Resources Association (SAHRA)</p> <p>Provincial Heritage Resource Agency (KZN – Amafa)</p>	Should any heritage sites be unearthed during excavations, a permit would be required to be obtained from SAHRA/ Amafa.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	obtained.		
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	National Department of Forestry, Fisheries and the Environment (DFFE)	No permitting is required. The act finds applicability during the public participation process phase of the Basic Assessment process.
Occupational Health and Safety Act (Act No. 85 of 1993)	The Occupational Health and Safety Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of 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.	Department of Labour	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the general public. E.g. Protection of workers on site through provision of Personal Protective Equipment's; Training and other health and safety amenities.
Other:  National Development Plan – Vision 2030			

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
<p>The National Development Plan (NDP) 2030 aims to address South Africa's developmental challenges of poverty and inequality by 2030. Key aspects deemed necessary to enhance social cohesion, reduce poverty and raise living standards include:</p> <ul style="list-style-type: none"> • Creating jobs and livelihoods • Expanding infrastructure • Transforming urban and rural spaces • Transitioning to a low-carbon economy • Improving education and training • Providing quality health care • Building a capable state • Fighting corruption and enhancing accountability • Transforming society and uniting the nation <p>The proposed LMMP is in alignment with the NDP through its potential to create employment and its plans to develop infrastructure.</p> <p>➤ New Growth Path Framework (NGPF), 2010</p> <p>The New Growth Path Framework (NGPF) aims to ensure that jobs and decent work are at the centre of economic policy. The NGPF has identified several job drivers and priority sectors that should be focused on over the coming years. These include:</p> <ul style="list-style-type: none"> • Infrastructure investment 			

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	<ul style="list-style-type: none"> •Prioritising efforts to support employment in the main economic sectors •Seizing the potential of new economies •Investing in social capital and public services •Spatial development •Fostering rural development and regional integration <p>The proposed LMMP shows alignment to the New Growth Path regarding its aim to invest in infrastructure and its potential to increase employment.</p> <p>➤ KwaZulu-Natal Provincial Growth and Development Strategy (PDGS) (2021 Draft for public consultation)</p> <p>The Provincial Growth Development Strategy (PGDS) provides KwaZulu-Natal with a reasoned strategic framework for accelerated and shared economic growth through catalytic and developmental interventions, within a coherent equitable spatial development architecture, putting people first, particularly the poor and vulnerable, and building sustainable communities, livelihoods and living environments (KwaZulu-Natal Provincial Planning Commission, 2021). The strategic pillars of the KZN PDGS are:</p> <ul style="list-style-type: none"> •Building a capable, ethical, and developmental state. •Economic transformation and job creation. •Education, skills, and health. •Consolidating the social wage through reliable and quality basic services. •Spatial integration, human settlements, and local government. 		

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
	<ul style="list-style-type: none"> • Social cohesion and safe communities. • Better Africa and Better world. <p>The proposed development aligns with the PDGS through its potential of enhancing the economic transformation and creating job opportunities.</p> <p>➤ KwaZulu-Natal Provincial Growth and Development Plan (PDGP) (2019)</p> <p>The main purpose of the Provincial Growth and Development Plan (PGDP) is to translate the PGDS into an implementation plan which will provide a sound platform for departmental, sectoral, and stakeholder annual performance planning and therefore to guide resource allocation. Its strategic objectives include:</p> <ul style="list-style-type: none"> • Develop and promote agricultural potential in KZN • Promote SMME and entrepreneurial development. • Support skills development to economic growth. • Advance social cohesion and social capital. • Enhance the resilience of new and existing cities, towns, and rural nodes, ensuring equitable access to resources, and social and economic opportunities. • Enhance resilience of ecosystem services • Expand application of green technologies <p>The proposed LMMP aligns with the PDGP through its potential to promote SMME development and enhances the resilience of new and</p>		

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
<p>existing cities, towns, and rural nodes, ensuring equitable access to resources, and social and economic opportunities through the provision of additional burial space.</p> <p>➤ KwaZulu-Natal Provincial Spatial Development Framework (PSDF) (2021)</p> <p>The KZN Provincial Spatial Development Framework (PSDF) vision is to utilise physical and environmental resources toward greater spatial integration and sustainability. In order to realize its vision, it has set out strategic goals which include:</p> <ul style="list-style-type: none"> • Improved integration between urban/ rural opportunities and needs • Sustainable use and protection of critical natural resources needed as basis for health and development • Sustainable land use management and spatial planning towards sustainable settlements • Reduce environmental degradation and loss which increases human vulnerability. • Create social, economic, and ecological resilience in spatial planning and land use management. • Develop and promote the agricultural potential of KZN. • Develop and promote the biodiversity economy in KZN. • Focus spatial economic development in strategic areas <p>The proposed LMMP is aligned with the PSDF since it will promote sustainable land use management and spatial planning towards sustainable settlements through the provision of additional burial space which will in turn create social, economic, and ecological resilience in spatial planning and land use management.</p> <p>➤ eThekweni Municipality Integrated Development Plan (2022/23)</p>			

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
<p>The intention of integrated development planning is to provide a framework for social and economic development in a municipality while also facilitating faster and more suitable service delivery. In order to achieve this, eThekwini aims:</p> <ul style="list-style-type: none"> •To provide growth and development opportunities to employees •To enable a performance driven environment •Enable provision of infrastructure and basic services delivery •To provide municipal Health Services in an effective and equitable manner •To enhance sustainable coastal & environmental management <p>The proposed LMMP is aligned the eThekwini IDP through its potential to provide employment opportunities and enable the provision of infrastructure.</p> <p>➤ eThekwini Municipality Spatial Development Framework(2021/2022) (SDF)</p> <p>The Spatial Development Framework for the eThekwini (2019) guides and informs all decision of the municipality relating to land use development and land planning. The key strategic goals and objectives which have been identified in line with the key issues include:</p> <ul style="list-style-type: none"> •Promote a uniform land use management system, •Promote economic and social development, •Promote accessibility to sustainable services and facilities, •Promote sustainable human settlements and safer communities 			

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Applicability to LMMP
The proposed LMMP is aligned to the objectives of the SDF as the development will contribute to promoting sustainable human settlements and safer communities, and creating jobs through economic and social development.			

6. PHASES OF THE PROJECT

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

The EMPr deals with the following phases as detailed below:

6.1 The Planning and Design Phase

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the development responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimise the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, action plans for the planning and design phase have been identified together with monitoring requirements.

6.2 The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

6.3 Rehabilitation Phase

This phase will involve restoring the land impacted during the construction phase back to its original state. This process will focus mainly on rectifying the negative impacts that have been caused during construction by the removal of pollution or contaminants and other dangerous substances from groundwater, sediment, or surface water and improvement of the soil.

6.4 The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

7. ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase. The stakeholders are discussed below.

7.1 Developer

The Developer shall:

- Remain ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr.
- Be responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr.
- Be liable for restoring the environment in the event of negligence leading to damage to the environment.
- Ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.
- Ensure that the compliance with the conditions of the environmental authorisation and the EMPr is audited.
- Appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.
- Submit an environmental audit report to the relevant competent authority (EDTEA).

7.2 Contractors and Service Providers:

All contractors (including sub-contractors and staff) and service providers shall:

- The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer and is responsible for ensuring that he adheres to all the conditions of the EMPr.
- Thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear.
- Ensure that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.

- Ensure adherence to the environmental management specifications.
- Ensure that Method Statements are submitted to the Site Manager and ECO for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMPr.
- Ensure that any instructions (whether verbal or written) issued by the site manager, project manager site engineer or ECO, in terms of the EMPr are adhered to.
- Ensure that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- Ensure that an incidents register is kept in the site office which lists all transgressions issued by the ECO.
- Ensure that a register of all public complaints is maintained.
- Ensure that all employees, including those of sub-contractors receive training before the commencement of construction so as to constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).
- Appoint an Environmental Liaison Officer (ELO).
- The ELO must have the appropriate experience and qualifications to undertake the necessary tasks.
- He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.

7.3 The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) will be responsible for monitoring, reviewing, and verifying compliance by the Contractor with the environmental specification of the EMPr and the conditions of the environmental authorisation (once issued). The ECO will:

- Attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:
- Be fully knowledgeable with the contents within the Basic Assessment.
- Be fully knowledgeable with the contents within the conditions of the Water Use Licence (once issued).
- Be fully knowledgeable with the contents within the Environmental Management Programme.
- Be fully knowledgeable with the contents within all relevant environmental legislation, and ensure compliance to them.

- Ensure that the contents of the EMPr are communicated to the Contractor site staff and that the Site Manager and Contractor are constantly made aware of the contents through discussion.
- Assist in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Review the Contractor's construction Method Statements.
- Undertake site inspections of all construction areas with regard to compliance to the EMPr.
- Monitor and verify adherence to the EMPr, the EA and approved Method Statements at all times.
- Monitor and verify that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Advise on the removal of person(s) and/or equipment not complying with the specifications.
- Audit the implementation of the EMPr and compliance with the EA on a monthly basis or at intervals specified in the environmental authorisation once issued.
- Compile a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer and the authorising authority.
- Have the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

(a) Liaison with Authorities

The ECO will be responsible for liaising with the EDTEA. The ECO must submit monthly environmental audit reports to the authorities. These audit reports must contain information on the contractor and the developer levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to Appendix 1) is to be kept on a continual basis.

(b) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

7.4 Resident Engineer

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the site diary, and enforce compliance.

7.5 Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to. The ELO should ideally also be a senior and respected member of the construction crew.

The ELO will be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register. This register must be presented at each EMC meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the ELO must keep a register of complaints from any community members on environmental issues. Finally, the ELO will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

8. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

Table 13 to Table 17 form the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following completion of construction and rehabilitation. This must be followed up with annual audits for a period of two years during the operational phase if rehabilitation was not successful in the first year.

Table 13: Planning and Design Phase

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Appointment and Duties of ECO	The developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	Developer	Once-Off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-Off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-Off
	Report on environmental compliance at the monthly site meetings.	ECO, ELO	As necessary
	An Environmental Completion Statement will be prepared by the ECO for submission to developer indicating completion of the project and compliance with the EMPr and conditions. This statement will be prepared after the final audit during the rehabilitation phase.	ECO	Once-Off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance	Contractor	Once-Off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	and co-operation of all personnel. He should be fluent in the languages of the employees.		
Permitting	The relevant authorisations and water use licenses must be obtained from Department of Water Affairs prior to the commencement of construction activities. No activities may proceed within or in proximity to watercourses without a Water Use License permitting the activity.	Developer, ECO	Once-Off
EMPr	This EMPr must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.	Developer, ECO	Once-Off
Training for Site Personnel	All Contractor teams involved in construction work are to be required to undergo some form of environmental induction on their obligations towards environmental controls and methodologies in terms of this EMPr, prior to commencing of the works.	Developer, ECO	Once-Off
	<p>The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include:</p> <ul style="list-style-type: none"> • What is meant by “Environment” • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions <p>It is the Contractor’s responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p> <p>Training should be provided to the staff members in the use of the appropriate fire-fighting</p>	Contractor	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<p>equipment. Translators are to be used where necessary.</p> <p>Use should be made of environmental awareness posters on site.</p> <p>The need for a “clean site” policy also needs to be explained to the workers.</p> <p>Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks.</p> <p>The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.</p>		
	<p>Environmental inductions may take the form of onsite talks and demonstrations by the Contractor and the ECO. Induction report will be signed by the Contractor as well as the Employee undergoing Induction, and records kept for auditing purposes and copies given to the ECO for filing. The education/ awareness programme should be aimed at all levels of management and staff within the Contractor’s team, and particularly labour drawn from surrounding communities.</p>	ELO, ECO, Contractor	Continuous
Record Keeping	<p>It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with related documents and other records related to this EMP.</p>	Developer, Contractor	As necessary
	<p>All specialist reports.</p>	Developer, Contractor	Continuous
	<p>The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced/</p>		

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	adhered to.		
	All records related to the implementation of this management plan (e.g. site instruction book, ECO reports, induction records, method statements, incident register must be kept together in an office where it is safe and can be retrieved easily.	Developer, Contractor, ELO	As necessary
	All relevant records should be kept for a minimum of two years after construction and should at any time be available for scrutiny by any relevant authorities or stakeholder.	Developer, Contractor	As necessary
Layout Plan	Layout plan indicating the alignment of service infrastructure (water, sewage, etc.).	Developer, Contractor	Once - off
	The extent of the construction sites and access roads should be demarcated on site layout plans and should be restricted to disturbed areas or those identified with low conservation importance. Therefore, no construction personnel or vehicle may leave the demarcated area except those authorised to do so. Those areas surrounding the construction site that are not part of the demarcated development area should be considered as “no-go” areas for employees, machinery or even visitors. Demarcations are to remain until construction and rehabilitation is complete.	Developer, Contractor	Once - off
Stormwater Management	Stormwater management plan for all access roads, buildings and parking areas.	Developer, Contractor	Once - off
Access	Access to and from the development area should be via existing agricultural contour roads.	Developer, Contractor	Continuous
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted unless required by the contract and with the permission of the RE.	Contractor, RE, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	Such repair or reinstatement will be to the Contractor's cost and shall receive priority over all other activities.	Contractor	Continuous
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Communication Mechanisms	Notify relevant stakeholders in writing, at least 10 days prior to commencement of site preparation.	Contractor, ELO	Once - Off
	Develop grievance mechanisms for the recording and management of complaints and grievances specifically including (but not limited to) grievances from those living in the area.	Contractor, ELO	Once - Off
Emergency Preparedness	If chemicals in sufficient quantity and toxicity have the potential to be released on the construction sites, emergency contingency plans should be prepared as safety measures (bunded areas). These safety measures should be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites.	Contractor, ELO	Once - Off
Method Statements	<p>The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include:</p> <ul style="list-style-type: none"> Logistics for the Environmental Awareness Training Course Location and Layout of Construction camp Construction procedures Cement, concrete, tar batching Solid and Hazardous Waste Management Drainage and stormwater planning 	Contractor	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<ul style="list-style-type: none"> • Dust control • Stockpiling area • Vegetation removal • Materials and equipment to be used • Getting the equipment to and from the site • How the equipment material will be moved while on site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble • General and Hazardous waste management on site • The storage provisions for the materials and/or equipment • The proposed construction procedure designed to implement the relevant environmental specifications • Other information deemed necessary by the RE and/or ECO. 		

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.		
	Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.	Contractor, RE, ECO	Continuous
	The Contractor shall carry out the activities in accordance with the approved Method Statement.		
	Under certain circumstances, the RE may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.	Contractor, RE	Continuous
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMP specifications.	Contractor, Developer	Continuous
Site Establishment	The contractor shall establish his construction camp, office/s and any other infrastructure as per the agreed site layout plan in a manner that does not adversely affect the environment.	Contractor, ECO	Once-Off
	The contractor shall submit a method statement for site clearance for approval by the RE in consultation with the ECO. Site establishment shall take place in an orderly manner and all required amenities shall be installed at site camp before the main workforce move onto site.	RE, Contractor, ECO	Once-Off
	Designate access roads during the planning phase.	Contractor, ECO	Once-off
	The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities to the satisfaction of the Project Manager. The	Contractor, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities. Maintenance must include their removal without sewage spillage.		
	Safe drinking water for human consumption shall be available at the site offices and at other convenient locations on site. All water used on site must be taken from a legal source and comply with the recognised standards.		
	No fires on site will be allowed. Activities which may pose a risk of fire must be identified and suitable measures must be put in place to prevent any possible damage by fire. Contractors must inform the staff of the risk of fires, fire prevention and emergency procedures in the event of a fire. Fire fighting equipment shall be supplied by the Contractor at suitable locations.		
	The construction camp must preferably be positioned where it will not visually impact on adjacent landowners and should not be located in an environmentally sensitive area.	Contractor, ECO	Once off
	All sensitive areas (i.e. heritage, ecological, wetland) should be demarcated and fenced off before development commences. These areas should be treated as “no go” areas.	Contractor, ECO, ELO	Continuous
	Invasive alien plant species should be treated in an appropriate manner.	ELO, Contractor	Continuous
	Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction.		
Environmental Impacts	<ul style="list-style-type: none"> • The servitudes existing on site must be respected and protected from all proposed impacts. • No activities may proceed within or in proximity to watercourses without a Water Use License permitting the activity. • The final route and watercourse crossing methods should impact on as little portion thereof as possible. 	Developer, ECO, ELO	Once-Off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<ul style="list-style-type: none"> • No construction camps or related activities should be situated in any vegetation of medium or high sensitivity. • The approved method statement must be available on site for reference purposes. • Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime of the watercourse i.e. through placement of structures/supports and to minimise turbulent flows in the watercourse. • Where possible plan construction to take place during the drier winter months. • Where possible plan construction activities to have the smallest possible footprint. • Minimise the width of the construction servitude (including running tracks) across a wetland zone. • Consider the various methods material and equipment available to install the pipeline and select whichever method(s) that will have the least impact on watercourses. • Demarcate the construction footprint prior to commencement of construction and ensure that all workers and contractors are aware that access beyond the demarcated areas are not allowed Where the pipeline will affect a wetland, the edge / boundary of this wetland must be clearly demarcated in the field with poles, sticks, or any solid structure that will last for the duration of the development. • Ensure that a copy of this and other applicable documents are available on site and that all workers and contractors are aware of it. Implementation thereof should be monitored by the appointed Environmental Officer (EO) or Environmental Control officer (ECO). • Plan construction activities that necessitate water crossings to only cross watercourses at designated points. • The height, width and length of structures must be limited to the minimum dimensions necessary to accomplish the intended function. • Make use of existing roads in such a way as to minimise impact on the wetlands. 		

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<ul style="list-style-type: none"> Plan construction activities that necessitate water crossings to only cross watercourses at designated points. Plan construction camps to be placed outside of watercourses and their associated buffer zones. Designate access roads during the planning phase allowing only wetland crossing at designated points. The approved method statements must be available on site for reference purposes. Activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics (DWAf, 2014). Plan excavation to take place only once the required materials are on site. This facilitates the immediate laying of the pipeline and minimises open trench time. Plan for necessary erosion protection measures to ensure the sustainability of all structures. Structures must be non-erosive, structurally stable and must not induce any flooding or safety hazards. Compile a comprehensive stormwater management plan for hard surfaces as part of the final design of the project. This must include appropriate means for the handling of stormwater within the site, e.g. separate clean and dirty water streams around the plant, install stilling basins to capture large volumes of run-off, trapping sediments, and reduce flow velocities (i.e. water used when washing the mirrors), as well as appropriate drainage around the site. Soil assessments should be conducted to assess the risk of contaminated seepage reaching the watercourse, and to formulate effective site-specific mitigation measures for the operation phase. 		
Loss of Heritage Resources	<ul style="list-style-type: none"> The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control 	Developer, ECO, ELO	Once-Off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<p>Officer shall be notified as soon as possible.</p> <ul style="list-style-type: none"> All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site. Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). 		
Layout Design	Designs should take into account soil properties, slopes and runoff energy with the aim of having a neutral effect on the regional hydrograph.	Developer, Engineer	Once-off
	Development must be concentrated in areas of low sensitivity and adjacent medium sensitivity where possible.	Developer, Engineer	Once-off
	Areas of moderate sensitivity should be targeted for indigenous green space and only low-impact activities considered in these areas (for example benches / gazebos / memorials with small footprints) and maintain the areas as natural grassland.	Developer, Engineer	Once-off
	Planned infrastructure on the site should take cognisance of ecological processes and allow for the movement of insects and smaller fauna that are imperative for pollination and seed distribution.	Developer, Engineer	Once-off
	Plan the cemetery to incorporate the natural features of grassland, making provision for limited lawns and plantings. Ideally, the grassland vegetation should remain and only be mowed biannually. This will ensure an open space that also has conservation value in terms of species diversity.	Developer, Engineer	Once-off
	During February March, mark all species that should be relocated. The protected species are dormant in winter and should be marked in late summer in order to remove and	Developer,	Once-off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	relocate them in August-September.	Contractor	
	These species can only be removed once a permit for the removal or relocation of such species was granted by the EDTEA.	Developer, Contractor	Once-off
	These species (except the orchids) can be relocated to gardens within the cemetery, provided that such gardens are not watered in winter.	Developer, Contractor	Once-off
	Although it is difficult to successfully relocate orchid species, an attempt should be made to relocate orchids with the development footprint to suitable moist grassland areas on the site.	Developer, Contractor	Once-off
	No areas of high sensitivity should be fragmented by roads.	Developer, Engineer	Once-off
	No roads should be constructed over the watercourse.	Developer, Engineer	Once-off

Table 14: Pre – Construction Phase

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Site Establishment	Plan construction activities to have the smallest possible footprint.	Contractor, Developer	Continuous
	The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.	ELO, Contractor, ECO	Continuous
	The site must be inspected by a botanist during the summer season to identify all protected tree species of conservation concern in order to record their existence for permitting purposes.	Contractor	Continuous
	Only necessary traffic should be allowed within these demarcated areas.	Contractor, ELO	Continuous
	Contractors should refrain from impacting areas beyond the demarcated construction area.		
	Minimise disturbance and loss of soil.		
	The contractor must avoid traffic or storing of equipment and material in vegetated areas that will not be cleared.		
Drilling at localised areas for geotechnical surveys	Keep disturbance of soil to a minimum.	Contractor, ELO	Continuous
	No drilling should be undertaken within areas demarcated as “no – go” areas (highly sensitive).		
	Do not remove vegetation outside the construction footprint.		
Social	Local individuals should be employed for work components that do not require a substantial amount of skill, e.g. foundation excavation, vegetation clearance, cleaning services, and security guards.	Developer	Continuous
	Individuals with the potential to develop their skills should be afforded training opportunities.	Developer	Continuous
	Identify targets for BEE and local employment.	Developer	Once off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Younger people tend to have higher levels of education and may stand in line for higher levels of employment. Opportunities for the employment of younger people should be maximised.	Developer	Once off
	Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities.	Developer	Once off
	Payment should comply with applicable Labour Law legislation in terms of minimum wages.	Developer	Continuous
	Contractor to develop jobsite security plan to curtail theft and crime as a result of the construction site.	Developer, Contractor	Once off
Community	<p>Ensure Adequate Construction Guidelines are in Place</p> <p>Construction of the proposed development should occur during specified times to reduce the negative impact on the community.</p> <ul style="list-style-type: none"> Construction times should be limited only to working hours between 8 and 5pm. Only authorised personnel should be allowed on the construction site. Access controls should be in place at all times. The public should be informed of the construction period and the necessary signage should be installed on the affected roads, residential and industrial areas. Safety precautions should be applied to trucks or bakkies moving on the road as the route is shared with a residential community. 	Developer, ECO, ELO	Continuous
Additional Traffic	<p>Ensure Adequate Traffic Management Controls are in Place</p> <p>To deal with the additional traffic flow during funeral processions it is important to have adequate traffic management controls in place.</p> <ul style="list-style-type: none"> These controls may include improved signage to warn motorists and residents of the 	Developer, ECO, ELO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<p>increased traffic and slow-moving vehicles on the affected road.</p> <ul style="list-style-type: none"> Alternative routes can be considered to divert traffic. When large crowds are expected, ensure that traffic controllers are in place to manage traffic. 		
Criminal Activity	<p>Ensure Adequate Safety and Security Measures</p> <p>The risks of vandalism, theft, robberies and assaults of visitors, illegal burials etc. are likely to increase with the proposed memorial park development. Therefore, it is essential that measures are in place to ensure the safety of visitors and residents. It is recommended that the following safety measures be implemented:</p> <ul style="list-style-type: none"> Security measures should include 24-hour security on-site. CCTV and gated access routes. Secure fencing around the memorial park. Adequate lighting. 	Developer, ECO, ELO	Continuous
Vegetation	Protected plants must be removed by a suitably qualified specialist and replanted in suitable habitat on the site. Their survival must be monitored for at least two growing seasons after relocation.	Developer, Contractor	Once off
	Construction workers may not tamper or remove these plants, and neither may anyone collect seed from the plants without permission from the local authority.	Developer, Contractor	Continuous

Table 15: Construction Phase

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Excavation	All excavation (if not working in the area) should be barricaded/covered to prevent safety and environmental accidents. Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Monitor daily
	Implementation of appropriate stormwater management around excavations to prevent the ingress of run-off into excavation areas and to prevent contaminated runoff into the watercourse.	Contractor	Continuous
	Minimise the time taken to complete each operation that is causing inconvenience or disruption in this area.	Contractor	Continuous
	Make a temporary access ways over any excavations.	Contractor	Continuous
	To inform property owners of the extent of the exact time and duration of closing entrances to any properties at any one time.	Contractor	Continuous
	<ul style="list-style-type: none"> • No excavation is to commence without an excavation method statement, agreed to by the geologist, site engineer and developer. • No excavation to commence on site without the lateral shoring / stabilisation methods signed off by the geologist, site engineer and safety officer. • No excavation of river banks to commence without the necessary indemnity forms/agreement/memorandum of understanding being signed off with the adjacent property owners. • No excavation of the river banks to commence without the contractor, professional consultants and developer having adequate insurance in place. • No excavation to commence or continue during any rain or wet spell. • Excavations to be done in an incremental fashion without exposing large areas of the river 	Developer, Contractor, ECO, ELO, Safety Officer	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	banks.		
	Trucks removing excavated material can cause compaction of soil if new pathways are created. Vehicles should, therefore, use existing roads. If the creation of new roads is unavoidable, these temporary roads should be ripped and re-vegetated after use.	ECO, Contractor	Monitor weekly
Site Housekeeping	The construction site and surrounds are to be maintained in a clean orderly and presentable condition at all times.	Contractor	Monitor daily
	Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.	Contractor, ECO	Weekly
	Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public as a whole.	Contractor	Continuous
Fire Prevention and Control	The Contractor shall ensure that there is basic fire-fighting equipment available on site as per requirement of the local Emergency Services.	Contractor, ECO	Continuous
	The Contractor shall ensure that all site personnel are aware of the fire risks and how to deal with any fires that occur. This shall include, but not be limited to: <ul style="list-style-type: none"> Regular fire prevention talks Posting of regular reminders to staff 	Contractor, ECO	Continuous
	Any fires, which occur, shall be reported to the Environmental Liaison Officer immediately and then to the relevant authorities.	Contractor, ECO	Continuous
Emergency Procedures	The Contractor shall submit Method Statements covering the procedures and response plan for the main activities, which could generate emergency situations through accidents or neglect of responsibilities. These situations include, but are not limited to: <ul style="list-style-type: none"> Accidental fires 	Contractor	As Necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<ul style="list-style-type: none"> Vehicle and plant accidents Blasting (if required) 		
	The contractor shall assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures.	Contractor	Weekly
Social	Inform local businesses about the expected influx of construction workers so that they can plan for the extra demand.	Developer	Once off
Mobilisation of pollutants	If concrete/ tar batching will be required on site. The contractors must provide and maintain a method statement for “cement, concrete and tar batching”. The method statement must provide information on proposed location, storage, washing and disposal of cement, packaging, tools and plant storage.	Contractor, Resident Engineer (RE), ECO	Once off
	Cement, asphalt and plaster should only be mixed within mixing trays. Washing and cleaning of equipment should also be done within a bermed area (outside of the wetland buffer), in order to trap any cement, asphalt or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase.	Contractor, ELO, ECO	As necessary
	The mixing of concrete/ tar should only be done at specifically selected sites on mortar boards or similar structures to contain run-off into drainage lines, streams and natural vegetation.	Contractor, ELO, ECO	As necessary
	Where access cannot be avoided into sensitive areas (wetland), the amount of vehicle and personnel traffic should be kept to a minimum and should make use of only one route.	Contractor, ELO, ECO	As necessary
	Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall.	Contractor, ELO, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas.	Contractor, ELO, ECO	Continuous
	In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately.	Contractor, ELO	As necessary
	Hydrocarbons spillages and dirty water from site must not be allowed to flow into the watercourse.	Contractor, ELO, ECO	Continuous
	All equipment should be parked overnight and/or fuelled at least 80 meters from the wetland.	Contractor, ELO	As necessary
	Spill kits must be available on site for the cleanup of any hydrocarbon spillages. In the event of oil, fuel or chemical spillage, appropriate bio-friendly detergents must be applied (Terrasorb or similar). Impacted soil must be removed and placed in an impermeable container for disposal at an appropriate hazardous waste site.	Contractor, ELO, ECO	Continuous
	A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas.	Contractor	As necessary
	Storage of potentially hazardous materials should be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.	Contractor	As necessary
	Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils.	Contractor	As necessary
	Drip trays must be placed under all leaking vehicles and machinery under repair and maintenance. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. The depth of the drip tray must be determined considering the total amount / volume of	Contractor, ELO, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.		
	Construction vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants.	Contractor, ELO, ECO	Continuous
	Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone.	Contractor, ELO, ECO	Continuous
	Construction must be restricted to the dryer winter months where possible.	Developer, Contractor	Continuous
	Remove all construction equipment and material on completion of construction.	Contractor, ELO	Once off
Sedimentation	Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the ECO.	Contractor, ELO, ECO	Continuous
	The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt/ sediment traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken.	Contractor, ELO	Continuous
	Silt trenches between the works area and downstream wetland could be used to trap any sediment washing off the works area and to prevent scouring of the stream line in case of heavy flows. This will provide protection for the downstream section of the wetland.	Contractor, ELO	Continuous
	Where wetlands are adjacent to the construction areas and these areas slopes toward the wetland, install sediment barriers along the edge of the construction areas as necessary to prevent sediment flow into the wetland.	Contractor, ELO	Continuous
	Where applicable, sediment barriers must be properly maintained throughout construction and	Contractor,	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	reinstalled as necessary until replaced by permanent erosion controls or restoration of adjacent wetland areas is complete.	ELO	
	Should water need to be pumped around the works area and discharged back into the wetland, care must be taken to ensure that the water is discharged in a manner that does not cause siltation or erosion downstream. As such it is recommended that any water to be discharged from pumping around the construction area or from dewatering operations be first discharged into a structure that allows the settlement of all suspended material, and which allows the diffuse discharge of water into the wetland. The water must be dissipated on re-entry into the wetland, to reduce the changes of erosion.	Contractor, ELO	As necessary
	Where applicable, sediment barriers must be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls is complete.	Contractor, ELO	Continuous
	It is important that topsoil should be conserved in areas where bedrock is shallow to avoid sedimentation.	Contractor, ELO	As necessary
Wetland Degradation	Where any hard structures (concrete, gabion or otherwise) are used, it should be well keyed into the surrounding bank walls and secured to the ground.	Contractor, ELO	As necessary
	Sediment-laden water may not be directed into the wetland.	Contractor	As necessary
	Flood protection berms should be installed in such a way that the river does not cause it to capsize.	Contractor, ELO	As necessary
	A temporary fence or demarcation must be erected around the works area to prevent access to wetland and buffer areas.	Contractor, ELO, ECO	Continuous
	Prevent pedestrian and vehicular access into the wetland and buffer areas as well as riparian areas.	Contractor, ELO, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Soil required for construction purposes must not be derived from the wetlands or rivers/streams.	Contractor, ECO	Continuous
	Consider the various methods of construction and take cognisance of that which will have the least impact on watercourses.	Contractor, ELO, ECO	Once off
	No equipment laydown or storage areas must be located within 20m of any delineated watercourse and/or within the 1:100 year floodline of any river.	Contractor, ELO, ECO	Once off
	No activities should take place in the watercourses and associated buffer zone. Where the above is unavoidable, only authorised activities should be undertaken. This is subjected to authorisation by means of a water use license.	Once off	Once off
	No materials must be dumped in the wetland and buffer zones.	Contractor, ELO, ECO	Continuous
	No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority.	Contractor, ECO	Continuous
	Store all litter carefully so it cannot be washed or blown into the water course	Contractor	Continuous
Erosion control	Stormwater should be adequately managed.	Developer, Contractor	Continuous
	Erosion/sediment control measures such as silt fences, low soil berms or wooden shutter boards must be placed around the stockpiles to limit sediment runoff from stockpiles.	Contractor	Continuous
	Temporary downslope erosion and sediment protection such as silt fences, sandbags and/or earthen berms must be established downslope of active work areas to protect downslope watercourses.	Developer, Contractor	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Steep slopes at risk of erosion and/or slumping must either be temporarily re-graded or temporarily stabilised using sandbags or other available material like dump rock.	Developer, Contractor	Continuous
	All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 2m) to break the energy of surface flows.	Contractor	Continuous
	Once shaped, all exposed/bare surfaces must be re-vegetated immediately.	Developer, Contractor	Continuous
	If re-vegetation of exposed surfaces cannot be established immediately, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence.	Developer, Contractor	Continuous
	All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully re-colonised the affected areas.	Developer, Contractor	Continuous
	After every significant rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until vegetation has re-colonised the rehabilitated area.	Contractor	Continuous
	When locating the construction site camp and equipment yard areas susceptible to soil erosion and/or contamination must be avoided.	Contractor, ECO	Once-off

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	The site camp must only be established within the proposed development site.	Contractor	Continuous
Basal Buffer	A basal buffer zone refers to the vertical soil succession which occurs between the base of the deepest grave and the water table, whether be it permanent or perched water table (Richards and Croukamp, 2004). While the recommended depth of the basal buffer zone is very variable depending on prevailing soil conditions and other factors, a minimum buffer zone depth of at least 2.5m is recommended (Richards and Croukamp, 2004). However, this is a minimum depth recommended and the basal buffer zone should ideally be deeper (Richards and Croukamp, 2004). Further to this, an appropriate specialist must be appointed to determine the correct depth of the basal buffer zone for the proposed Memorial Park.	Contractor	Continuous
Clearing of Vegetation	The clearing, cutting and removal of trees and areas of natural vegetation must be done in consultation with the ECO and the ELO and a relevant permit if applicable must be obtained and kept on site.	Contractor, ELO, ECO	Continuous
	Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.	Contractor, ELO, ECO	Continuous
	Construction workers may not tamper or remove plants of conservation concern; neither may anyone collect seed from the plants without permission from the local authority.	Contractor, ECO, Construction workers.	Continuous
	Indigenous trees removed during construction must be replaced with the same species at a ratio of 1:2 (2 trees must be planted for every 1 tree removed).	Contractor, ELO, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Protected trees removed during construction must be replaced with the same species at a ratio of 1:5 (5 trees must be planted for every 1 tree removed).	Contractor, ELO, ECO	Continuous
	Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species.	Contractor, ELO, ECO	Continuous
	During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled.	Contractor, ELO, ECO	Continuous
	All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum.	Contractor, ELO, ECO	Continuous
	The working strip required for the construction of the proposed development must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained. The clearing of vegetation must be kept to a minimum.	Contractor, ELO, ECO	Continuous
	Should the construction phase occur in the rainy season, the erection of berms may be necessary in areas prone to erosion (e.g. steep slopes or erosive soils) These bermed areas must be monitored frequently for signs of erosion.	ELO, Contractor	Once off, monitor weekly
	The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.	Contractor, ELO, ECO	Continuous
	Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species.	Contractor, ELO, ECO	Continuous
	Vegetation to be retained during the construction phase must be clearly demarcated with danger tape, especially on steep slopes.	ELO, Contractor	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Collection of firewood from neighbouring properties is strictly prohibited.	Contractor, ELO, ECO	Continuous
	No fires may be ignited with the intent to destroy the flora on site and surrounding properties.	Contractor, ELO, ECO	Continuous
	Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas.	Contractor, ELO, ECO	Continuous
	Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed.	Contractor, ELO, ECO	Continuous
Vegetation	<p>A vegetation rehabilitation plan should already be implemented during the establishment of the cemetery to rehabilitate areas of grassland that will be affected by edge effects. Such a plan should restore disturbed areas beyond the footprint of the infrastructure to what it was prior to construction, thereby making the impact on the remainder of the site negligible in the long term. Due to the dry climate, natural colonisation could take a long time, in which vegetation may degrade further or become dominated by encroacher or invasive plant species. Therefore, timeous rehabilitation is imperative. Even in the event of good rains, annual pioneer plants are short-lived and therefore an effort must be made to keep as many shrubs in place as possible or to replace these as part of rehabilitation.</p> <ul style="list-style-type: none"> The grassland can be removed as sods and stored within transformed vegetation or other disturbed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, 	Contractor	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	<p>the sods should be watered well after planting and at least twice more over the next 2 weeks.</p> <ul style="list-style-type: none"> Grasses that naturally occur in the area should be sown / hydroseeded in the disturbed footprint. 		
Fauna Management	Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.	Contractor, ELO, ECO	Continuous
	Where possible, work should be restricted to only one area, to give smaller fauna species the opportunity to move into undisturbed natural habitat.	Contractor, ECO	Continuous
	The feeding or leaving of food for stray or wild animals in the area is strictly forbidden.	Contractor, ECO	Continuous
	No animals may be hunted, trapped or disturbed nor is fishing allowed.	Contractor, ECO	Continuous
	Nesting and breeding sites for birds and mammals must be avoided at all costs.	Contractor, ECO	Continuous
	Should fauna be encountered during site clearance or during construction activities, earthworks shall cease immediately, until such fauna have been safely relocated.	Contractor, ECO	Continuous
	No animal will be killed, unless an immediate threat to human health is perceived. In such an instance, the incident must be reported to the ECO and PM immediately.	Contractor, ECO	Continuous
	Photographs of fauna encountered on site must be displayed in the construction camp to heighten awareness of these creatures.	Contractor, ECO	Continuous
	Compile and implement an alien invasive management plan in line with the municipal	Contractor	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	management plan, which must include measures to prevent attracting additional alien avifauna and mammals to site. This should include not feeding wild life and ensuring that all food and food waste, including domestic waste, is placed in sealed containers and not exposed on site. Ensure that the outside areas are kept clean and tidy and provide adequate waste removal services to prevent the attraction of rats and other alien scavenging species to the site.		
	Clear all domestic and food waste from site on a daily basis.	Contractor	Continuous
Proliferation of alien invasive species	Manual removal methods are preferred to chemical control.	Contractor, ELO	As necessary
	Alien invasive species, in particular category 1b and category 2 wattle species that were identified on site must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.	Contractor, ELO, ECO	As necessary
	All alien seedlings and saplings must be removed as they become evident for the duration of construction.	Contractor, ELO, ECO	Continuous
	Appointment of alien plant working group / assign this duty to specific staff. A vegetation specialist must be consulted where there is uncertainty between alien, invasive and indigenous vegetation.	Developer	As necessary
	Compile and implement an alien invasive monitoring plan to remove alien invasive plant species from the cemetery site.	Developer	Once-off for Continuous
	An ongoing monitoring and eradication programme for all invasive and weedy plant species growing within the servitude must be implemented.	Developer, ECO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	If herbicide must be used it should be registered for aquatic use.	Contractor, ELO, ECO	As necessary
	Acquire the necessary equipment for removal and control.	Developer, Contractor, ELO	As necessary
	Planned sequence of areas to be cleared of invasive plants.	Contractor, ELO, ECO	As necessary
	A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage.	Contractor, ELO	As necessary
	Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc.	Contractor	As necessary
	Ensure that only properly trained people handle and make use of chemicals.	Contractor	As necessary
	Ensure that contractors can identify the relevant plants and are aware of the removal procedures.	Developer	As necessary
	Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils.	Contractor, ELO	Continuous
	Dispose of the eradicated plant material at an approved solid waste disposal site.	Contractor	As necessary
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	Contractor , ELO,	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Hazardous materials storage	If potentially hazardous substances are to be stored on site, the contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.	Contractor	Monitor daily - weekly
	The waste, resulting from the use of hazardous materials, shall be disposed of at a hazardous waste disposal site as approved by the RE. Storage and disposal of waste is regulated through other legislation, which should be complied with i.e. the Occupational Health and Safety Act. Records for disposal must be kept in the environmental file.	Contractor, RE	Monitor daily - weekly
	Surface water draining of contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils.	Contractor, RE	Monitor daily - weekly
	Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site.	Contractor, RE	Monitor daily - weekly
	Materials storage areas will not be allowed in close proximity to ecologically sensitive areas.	Contractor	Continuous
	Materials storage areas should be sited outside the 1:100 year flood line of watercourses.	Contractor, ECO	Continuous
	The areas around fuel tanks are to be bunded in accordance with SANS 1089:1999: Part 1.	ELO, Contractor	Once off
	The bund wall should be high enough to contain at least 110% of any stored volume.	Contractor	Continuous
	The surface of the bunded surface should be graded to the centre so that spillage may be collected and satisfactorily disposed of.	Contractor	Continuous
	44-gallon drums must be kept on site to collect contaminated soil. These should be disposed of	Contractor	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	at a registered hazardous waste site.		
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers and all relevant Material Safety Data Sheets (MSDSs) shall be available on site.	Contractor	Continuous
	The relevant emergency procedures relevant to particular chemicals used on site, as per the MSDSs and suppliers guidelines, will be followed in the event of an emergency.	Contractor	Continuous
	The contractor shall prevent discharge of any pollutants such as cement, concrete, lime, chemicals, fuels and oils into any water sources and adequate storm water control measures will be implemented where these substances are handled.	Contractor	Continuous
Handling and disposal of contaminated water	No discharge of pollutants such as cement, concrete, lime, chemicals, fuels or oils will be allowed into any water resource.	ELO, Contractor	Continuous
	Only above ground temporary storage tanks will be allowed on site.	ELO, Contractor	Continuous
	Contaminated or potentially contaminated water will be kept separated from unpolluted stormwater and no unpolluted stormwater will be allowed into the conservancy tank.	ELO, Contractor	Continuous
Lighting	Working hours shall generally be restricted to daylight hours. If working hours are required outside of daylight hours, the contractor shall provide notification to all landowners (direct and adjacent). Should overtime/night work be authorised, the contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighbouring residents.	ELO, Contractor	Continuous
	Security lights shall be directed from the perimeter wall towards the centre of the camp with a down angle.	ELO, Contractor	Continuous
Waste management	Litter generated by the construction crew must be collected in rubbish bins and disposed of	ELO,	Weekly

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	weekly at registered waste disposal sites.	Contractor	
	Bins should be monkey-proof.	Contractor	Continuous
	All building rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	Waste is not to be buried on site.	ELO, Contractor, ECO	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily
	Recycling must be encouraged on site and recycling bins must be provided at the contractor's camp and clearly marked.	Contractor, Construction crew	Monitor daily
	A culture of "conserve, reduce, reuse & recycle" should be promoted with regards to the use and disposal of products to minimise resource consumption and reduce the amount of potential waste. Project design can also promote the conservation and efficient utilisation of water, implement rainwater harvesting measures, the recycling / re-use through grey water systems and using water efficient fittings.	Contractor, Construction crew	Monitor daily
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or	ELO, Contractor	Monitor daily - weekly

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	after the construction period of the project are disposed of at an approved dumping site.		
Stormwater Management	<p>An adequate stormwater management plan must be in place and must ensure:</p> <ul style="list-style-type: none"> • Construct cut-off berms downslope of working areas and demarcate footprint areas to be excavated to avoid unnecessary digging. • Use semi-permeable surfaces that can absorb artificial run-off but releases a certain amount into the landscape. • Energy dissipating structures must be installed. • Maintain drains and attenuation structures. • Ensure all clean water is dissipated towards the natural flow area and all dirty water is directed towards a control structure. 	Developer, Contractor	Once-off for Continuous
	Ensure that future stormwater infrastructure is designed with effective attenuation ability so as to prevent the release of high energy stormwater into the wetland.	Developer, Contractor	Once-off for Continuous
	Importantly, the stormwater management system and related infrastructure is likely to require regular on-going maintenance in the form of silt, debris/litter clearing in order to ensure the optimal functioning of such systems. Storm water management systems will therefore be designed with longevity in mind and in order to require little maintenance by catering for silting, etc. Any damaged infrastructure will need to be repaired or replaced as necessary.	Developer, Contractor	Continuous
	Monitor for downstream impacts including sedimentation during the construction phase. The principles of the SUDS (South African Guidelines for Sustainable Drainage Systems, Armitage <i>et al</i> , 2013) should be applied to future infrastructure design. Water throughout the site (not only in the wetland and its buffer) should be allowed to filter into the soil. Concrete channels should be avoided.	Developer, Contractor	Once-off for Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Should a freak storm displace the temporary earth embankments or other erosion control structures, a visual inspection of the site must be made and any damage be recorded. Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the temporary walls collapse due to construction error, the contractor is to fund the remediation process.	Contractor, ELO, ECO	Continuous
	Stormwater at the site camp must be managed so as to reduce the silt loads into the ecological environment. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.	Contractor, ELO, ECO	Continuous
	The site must be managed in a manner that prevents pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemicals.	Contractor, ELO, ECO	Continuous
	No stockpiles or construction materials may be stored or placed in close proximity to storm water drains.	Contractor, ELO, ECO	Continuous
	Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.	Contractor, ELO, ECO	Continuous
Noise management	Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.	Developer, Contractor	Monitor daily
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Ensure that noise licensers are installed on the construction vehicles and machineries to reduce the noise level.	ECO, ELO, Contractor	Continuous
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, ELO, Contractor	Continuous
Dust control	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may heavy smoke be released into the air.	Developer, Contractor	Daily
	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, ELO	As necessary
	Exposed stockpile materials (e.g. topsoil or building sand) must be adequately protected against wind (covered), and should be sited taking into consideration the prevailing wind conditions.	ECO, ELO	As necessary
	Subsoil and topsoil is to be stockpiled separately. Stockpiled soil must be replaced in the reverse order as to which it was removed (subsoil first followed by topsoil).	Contractor	As necessary
	Stockpiles of construction materials must be clearly separated from soil stockpiles in order to limit any contamination of soils.	Contractor	As necessary
	Stockpiled soils are to be kept free of weeds and are not to be compacted. The stockpiled soil must be kept moist using some form of spray irrigation on a regular basis as appropriate and according to weather conditions.	Contractor	As necessary
	If soil stockpiles are to be kept for more than 3 months they must be hydro-seeded.	Contractor	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	The slope and height of stockpiles must be limited to 1.5m and are not be sloped more than 1:2 to avoid collapse.	Contractor	As necessary
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches.	ELO, Contractor	Continuous
Crime, safety and security	Ensure that the construction vehicles are under the control of competent/ suitably qualified personnel and are in proper working order.	Contractor	Continuous
	Ensure that the contact details of the police or security company and ambulance services are available on site.	Contractor	Continuous
	All incidents of theft or other crime should be reported the South African Police Service, no matter how seemingly insignificant.	Developer, Contractor, ECO, ELO	As necessary
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Continuous
	Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards.	Contractor, Construction crew	Continuous
	Equipment and materials must be handled by staff that have been supervised and adequately trained.	ELO, Contractor	Continuous
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	ELO, Contractor	Continuous
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	ELO, Contractor	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	The security fence around the development site must be completed before construction commences internally.	ELO, Contractor	Once-off
	Security fence is to be inspected daily to ensure no illegal entry points are created.	ELO, Contractor	Daily
	The contractor must supply his own security arrangements for the construction camp within the framework of the EMPr.	Contractor, ELO	Continuous
	Staff must be regularly updated about the safety procedures.	Contractor, ELO	Continuous
	Emergency facilities must be available and adequately supplied for use by staff and customers.	Contractor, ELO	Continuous
	Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence.	Contractor, ELO	Once-off, monitor daily
	Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles/ machinery.	Contractor, ELO	Once-off, or as necessary
Stockpiling soil	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation.	Contractor, ELO, ECO	As necessary
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	As necessary
	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely	ECO, Contractor	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	to cause erosion or where water would naturally accumulate.		
	The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.	ELO, ECO, Contractor	As necessary
	Topsoil must be reinstated or imported where necessary for vegetation to be re-established.	ELO, ECO Contractor	As necessary
	All excavated material to be stockpiled more than 80m from the river area and marked for spoil elsewhere as stipulated by the geologist/geological engineer.	Contractor, ELO ECO	Continuous
Heritage resources	Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible.	ELO, Contractor	As necessary
	Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible.	ECO, Contractor	As necessary
	Under no circumstances shall archaeological artefacts be removed, destroyed or interfered.	ELO, Contractor	Continuous
	Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.	ECO, Contractor	As necessary
Palaeontology resources	If palaeontological material is found, the "Chance Find Protocol" must be in place. This is attached as Appendix 2.	ECO, Contractor	As necessary
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area.	ELO, Contractor	Continuous
	Remove spoil material from the area once the trench has been filled.	Contractor	Continuous
	Remove vegetation and topsoil and stockpile separately from subsoil prior to excavation of the	ELO,	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	trench.	Contractor	
	Revegetate disturbed ground in the working area by seeding and spreading of vegetation that has been removed from the trench at the start of construction.	ELO, Contractor	Continuous
Traffic impact	Access to the site must follow current and established routes The contractor should be responsible for any damage caused to the road or road curb/verges.	Developer, Contractor	Continuous
	It is recommended that a speed limit of 30km/h is implemented on all roads running through the study area during all phases in order to minimise risk to fauna from vehicles.	Developer, Contractor	Continuous
	No unnecessary vehicles will be allowed within the 100 m buffer of sensitive environments (wetland, pans, drainage lines)	Developer, Contractor	Continuous
	All road safety and warning signs must be as stipulated by the Roads and Traffic Act (Act 93 of 1996).	Developer, Contractor	Continuous
	Points-men with access boom and warning flags for traffic to be on site.	Developer, Contractor	Continuous
	Construction and traffic warning signs to be placed.	Developer, Contractor	Continuous
Sewage	Onsite treatment will be undertaken through the use of chemical toilets. The toilets will be serviced periodically by the supplier.	ELO, Contractor	Continuous
Electricity	Diesel generators will be utilised for the provision of electricity if connections are unavailable.	ELO, Contractor	Continuous
Completion of Construction	The ECO must ensure that all construction equipment and all foreign material are removed on completion of construction.	ECO	After completion of

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
			construction
	It must be ensured that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned to a usable state or at least to its condition prior to construction.	Developer, Contractor	After completion of construction
	All excavations and borrow pits (where applicable) associated with the proposed construction works must be made safe through backfilling with in situ material followed by grading.	Contractor	After completion of construction
	Backfilling must be followed with the deposition of subsoil, followed by topsoil, with compaction taking place in layers. If backfill is deficient, additional fill may only be imported from approved borrow areas as indicated by the ECO. Backfilled areas must be monitored for subsidence as the backfill settles and any depressions must be filled using available material.	Contractor	After completion of construction
	Topsoil application must take place prior to the rainy season to avoid washing away of soils.	Contractor	After completion of construction
	All disturbed areas are to be shaped to blend in with the surrounding landscape.	Contractor	After completion of construction
	No slopes steeper than 1(V):3(H) should be permitted, unless otherwise specified and	Contractor,	After

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	approved by the ECO. New slopes must mimic the natural slopes and topography.	ECO	completion of construction
	On completion of construction activities, monitoring should be done in order to record compliance with the targets set out in the EMP and to highlight any areas where further action are required in terms of rehabilitation or routine monitoring (refer to monitoring plan).	ELO, Contractor, ECO	As necessary

Table 16: Operational Phase

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Compliance with legislation, policies and procedures	<p>All legislation, policies and procedures applicable to the development must be strictly enforced, including but not limited to, the following:</p> <ul style="list-style-type: none"> • National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA); • Nation Water Act; • Hazardous Substances Act, 1973 (Act No. 15 of 1973); • Fire Brigade Services Act, 1987 (Act No. 99 of 1987); • Occupational Health and Safety Act, 1993 (Act No. 85 of 1993); and • Operational Phase EMPr. 	RPE	Continuous
Site Monitoring, Auditing and Reporting	<ul style="list-style-type: none"> • All records relating to monitoring and auditing shall be made available for inspection to any relevant authority. • EDTEA reserves the right to monitor and audit the development throughout its full life cycle to ensure compliance with the RoD as well as mitigation measures in the final basic assessment report and the EMPr. • The adjacent property owners shall always be kept informed about any changes to the operation. 	RPE/PM	Continuous
Protection of Sensitive Environments and Natural Features	<p>Alien species of vegetation should be removed from any working areas and the site camp(s). Alien vegetation species should also be eradicated when they begin to establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). In order to discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO.</p>	ELO, Contractor, ECO	As necessary
	Checks must be carried out at regular intervals to identify areas where erosion is occurring.	Developer	As

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Appropriate remedial actions, including the rehabilitation of the eroded areas are to be undertaken.		necessary
	Checks must be carried out at regular intervals to identify any avian mortalities.	Developer	As necessary
Vegetation	Re-vegetated sites should be monitored for invasion by alien seedlings on a regular basis. Such seedlings should be removed by hand.	Developer	Continuous
	Do not mow the grass within the moist grassland and allow natural fires to burn the area.	Developer	Continuous
	Do not mow the grasslands during late summer (December to April) when these species are in flower and seed.	Developer	Continuous
	If no natural fires burn the grass for three years or more, consult an ecologist with regards to a burning programme to maintain the grassland characteristics.	Developer	As necessary
	The relocated species should be monitored for at least two years post relocation. If die back is noted, a specialist should be consulted and corrective action taken as soon as possible.	Developer	Continuous
	No operational activities can impact on the relocated species.	Developer	Continuous
Health & Safety	An emergency plan (including fire management) must be developed and implemented; the relevant authority must approve this plan. Ensure that all fire extinguishers are replaced on or before their expiry dates.	Developer	Continuous
	Site Safety checks should be carried out in accordance with the pertinent Occupational Health and Safety requirements prior to site closure.	Developer	Continuous
	Telephone numbers of emergency services shall be posted conspicuously in the office for use	Developer	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
	in emergency situations		
Social	Where local skills are not available for the operation and maintenance of the development, the developer should consider capacity building and training to ensure that locals are employable.	Developer	Continuous
Pollution of the wetland	During maintenance, activities should be limited to the areas where maintenance has to be undertaken.	Developer	Continuous
	In the event that maintenance must be carried out, all equipment should be parked overnight and/or fuelled at least 30 meters from the wetland	Developer	As necessary
	Groundwater monitoring network is required. Water sampling for quality analysis is recommended quarterly, and water level monitoring must be conducted monthly. Water samples must be taken from the monitoring boreholes by using approved sampling methods and adhering to recognised sampling procedures. An accredited laboratory must be used for water quality analysis.	Developer, Contractor, ELO, ECO	Continuous
	Pollution to watercourse via seepage from grave sites must be prevented	Developer, Contractor, ELO, ECO	Continuous
	Storage of maintenance materials/ chemicals may not be within the 32m of wetland or associated buffer areas.	Developer	As necessary
	The SHE must ensure that all maintenance equipment and material are removed on completion of maintenance.	Developer	As necessary
	Removal of vegetation during maintenance should be limited to the area of operation only.	Developer	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Prevent/limit sedimentation	The contractor shall ensure that a method statement is prepared prior to maintenance work to ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt/ sediment traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken.	Developer	As necessary
Preventing spread of alien invasive	Plan an alien invasive plant work group that can carry out follow-up alien plant control for at least three years after construction.	Developer	As necessary
	Ensure that contractors can identify the relevant plants and are aware of the removal procedures.	Developer	As necessary
	Remove alien invasive species from the disturbance footprint as soon as they become apparent.	Developer	As necessary

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Mechanical	<ul style="list-style-type: none"> • The water services provider to provide process control services. • Leak detection and management plan must be in place. • Constant monitoring is required. • In addition to the monitoring obligations set out above, it is recommended that the applicant develop and implement a surface water quality and biomonitoring programme for watercourses that receive wastewater from the WWTW. This should be developed and implemented by a suitable qualified aquatic ecologist. The monitoring programme needn't be complicated in nature and should include at a minimum biannual water quality sampling of selected determinands, supplemented by SASS5 biomonitoring and basic visual investigations at suitable sites. • A Contingency Plan for Aquatic Ecosystems (wetlands & rivers/streams) to be developed for the project. Emergency breakdowns to be handled by the contracted mechanical and electrical service provider. Process emergencies will be handled by appointed service provider. • The water service provider for the routine electrical/mechanical maintenance and breakdown interventions on the plant. • Daily plant inspection by supervisory staff. • Weekly inspections and sampling visits (service provider to be appointed). • In the case of mechanical breakdown, all essential items of equipment are provided with a standby to assume duty in the event of a break down. • Similarly, all switchgear (with the exception of the transformer) is duplicated with the mechanical plant. • In the event of an electrical breakdown or outage, a standby genset will be installed to provide emergency power. • Process poisoning can occur if poisons find their way into the sewer system, this is unlikely as the system is for domestic sewage only and not industrial effluents. • If the operation of the works is not diligent, then process failure could result. The water 		

Table 17: Rehabilitation Phase

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Erosion	The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is limited after construction has been completed.	Contractor, ELO	During and immediately after construction
	All slopes that are disturbed during construction should be stabilised immediately to prevent erosion.	Contractor	During and immediately after construction
	Re-vegetation should be done immediately after construction, especially in sloped areas.	Contractor	During and immediately after construction
	Disturbed areas that require rehabilitation should be mulched to encourage vegetation re-growth.	Contractor	As necessary
	Bare ground exposed after vegetation removal must be rehabilitated as soon as possible.	Contractor, ELO, ECO	As necessary
	Monitor rehabilitation and occurrence of erosion and take immediate corrective action where needed.	Developer	Twice during the rainy season for at least two years

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Mobilisation of pollutants	Remove all project-related material used to support equipment on completion of construction.	Contractor, ELO	Once off
	Any contaminated soil from the onsite needs to be removed and properly disposed off.	Contractor, ELO, ECO	As necessary
	Materials such as fuel, oil, paint, herbicides and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas.	Contractor, ECO, ELO	Continuous
	These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall.	ECO, Contractor, ELO	Continuous
	Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.	Contractor, ELO	As necessary
	Any water discharged must comply with the relevant Water Quality limits/guidelines specified by DWS.	Contractor, ELO	As necessary
	Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.	Contractor, ELO	Continuous

ACTIVITY / ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	MONITORING FREQUENCY
Vegetation	It is recommended that landscaping promote the use of indigenous species common to the region and that as much natural ground cover is established on the site to help with binding soils and encouraging water infiltration, thus reducing overland flows and the pressure on storm water management infrastructure. Any of the following plant species are recommended <i>Cynodon dactylon</i> , <i>Stenotaphrum secundatum</i> , <i>Paspalum distichum</i> .	Contractor, Developer	Once-off
	No exotic vegetation may be planted on the site.	Contractor, Developer	Continuous
	Limit the planting of lawns.	Contractor, Developer	Continuous
	Only plant indigenous trees naturally occurring in the Egoli Granite Grassland e.g. <ul style="list-style-type: none"> • <i>Senegalia caffra</i> • <i>Acacia (Vachellia) karroo</i> • <i>Celtis Africana</i> • <i>Combretum erythrohyllum</i> • <i>Diospyros lycioides</i> • <i>Euclea crispa subsp crispa</i> • <i>Searsia lancea</i> • <i>Searsia pyroides</i> 	Contractor, Developer	Continuous
	Consider indigenous host plants to the existing butterfly species on site.	Contractor, Developer	Continuous

9. ENVIRONMENTAL AWARENESS PLAN

OBJECTIVE: Ensure all operation personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm (Environmental Awareness Plan).

To achieve effective environmental management, it is important that Contractors and site employees are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. The developer is responsible for informing its employees and contractors (transportation contractor) of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The developer's obligations in this regard include the following:

- Employees must have a basic understanding of the key environmental features of the depot and its surrounding environment.
- Ensuring that a copy of the EMP is readily available on-site, and that all site staff are aware of the location and have access to the document. Employees must be familiar with the requirements of the EMP and the environmental specifications as they apply to the operation of the facility.
- Ensuring that, prior to commencing any new site works, all employees have attended an Environmental Awareness Training course. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- Awareness of any other environmental matters, which are deemed to be necessary by the depot manager.
- Ensure that construction workers have received basic training in environmental management, including the storage and handling of hazardous substances, minimise of disturbance to sensitive areas (wetland), management of waste and prevention of water pollution.
- Records must be kept of those that have completed the relevant training.
- Training should be done either in a written or verbal format but must be in an appropriate format and language for the receiving audience.
- Refresher sessions must be held to ensure the operating staff are aware of their environmental obligations.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMP. This training and awareness will be achieved in the following ways:

9.1 Environmental Awareness Training

Environmental Awareness Training must be undertaken by the Environmental Control Officer and must take the form of an on-site talk and demonstration by the Environmental Control Officer before the commencement of construction activities on site. A record of attendance of this training must be maintained by the Environmental Officer on site.

9.2 Induction Training

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations – contractors or engineering staff; site staff, sub-contractors or visitors to site.

This induction training should include discussing the developers' environmental policy and values, the function of the EMP and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The reporting procedure must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE officer on site.

9.3 Toolbox Talks

Toolbox talks should be held on a scheduled and regular basis (at least once a month) where the foreman/site supervision manager, environmental and safety representative and all employees on site hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

10. MONITORING PROGRAMME

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards.

A monitoring programme must be in place not only to ensure conformance with the EMP, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (once issued). Where this is not clearly dictated, the Developer will determine and stipulate the frequency of monitoring required in consultation with the relevant authority. The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.
- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

10.1 Method of Monitoring

The independent ECO will ensure compliance with the EMP, and will conduct monitoring activities. The ECO will undertake site inspections on a monthly basis or as specified in the environmental authorisation once issued. The ECO will report all non-compliances to the Site Manager and submit such reports to EDTEA.

10.2 Non-Conformance Report

All supervisory staff and ECO must be provided a means to be able to submit a non-conformance report to the site manager. The non-conformance report will describe in detail, the cause and effect of any environmental non-conformance by the contractor. Records of penalties may be required by the Authorities within 48 hours. The non-conformance report will be updated upon completion of the corrective measures indicated on the findings sheet. The report must indicate that remediation measures have been implemented timeously and that the non-conformance can be closed out to the satisfaction of the site manager and ECO.

10.3 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to EDTEA as deemed practical or with the Final audit report. The report should include details of the activities undertaken in the reporting period, any non-conformances or incidences recorded, corrective action required and details of these non-conformances or incidents which have been closed out.

10.4 Internal Audits and Reporting

Internal audits must be undertaken by the developer. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr. Findings of the audit must be made available to the external auditor.

10.5 Final Audit Report

A final environmental report must be compiled by the ECO and submitted to EDTEA upon completion of construction and rehabilitation activities within 30 days of completion of the construction phase (i.e. within 30 days of the site handover and within 30 days of completion of rehabilitation activities). This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance of the environmental authorisation conditions once issued and the requirements of the EMPr.

11. CONCLUSION

Provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor should thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

11.1 Key issues

- Construction should take place in the dry season, leaving enough time for the germination of seeds and revegetation of barren areas before the onset of the rainy season.
- Warning tape must be erected to inform public of the inherent dangers.
- Regarding potential blasting activities that may be required on certain areas, it is important that the adjacent landowners are informed of these planned activities a few days in advance and that site notices informing the public are strategically placed at visible locations.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	Env. Condition	Comments <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	Signature

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APPENDIX 2: CHANCE FIND PROTOCOL

If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material:

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.
- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labeled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future.

Functional responsibilities of the Developer

1. At full cost to the project, and guided by the appointed Palaeontological Specialist, ensure that a representative archive of palaeontological samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation.
2. Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas.
3. Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found.
4. Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.
5. Provide covered, dry storage for samples and facilities for a work area for sorting, labeling and boxing/bagging samples.

6. Costs of basic curation and storage until collected. Documentary record of palaeontological occurrences must be done.
7. The contractor will, in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist.
8. Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period.
9. Locations of samples and measured sections are to be pegged, and routinely and accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally if any "significant fossils" are recorded during the time of excavation.

APPENDIX 3: EAP CV
