MAINTENANCE MANAGEMENT PLAN

FOR THE MAINTENANCE AND UPGRADE OF EXISTING STORMWATER LINES AND MANHOLES FOR THE CONSTRUCTION OF BRT LINE 3 AT PRINCE'S PARK AVENUE AND BUS STOPS/BAYS ALONG WF NKOMO STREET, PRETORIA, GAUTENG PROVINCE

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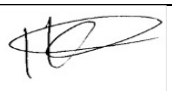
Prepared by Selahle Consultancy & Projects (Pty) Ltd	**Sibongile Hamisi** *Cand.Sci.Nat*		20 April 2026
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REPORT DETAILS	
Title:	Maintenance Management Plan for the Upgrading and Maintenance of existing stormwater lines and manholes for the construction of BRT line 3 at prince's park avenue and bus stops/bays along WF Nkomo street, Pretoria, Gauteng province.
Purpose of this report	The purpose of this Report is to: ▪ To ensure environmental compliance ▪ Undertake sensitivity analysis based on the EIA Screening Tool and GDARD's Conservation Plan; ▪ Conduct a site evaluation to become familiar with the habitat diversity and inherent ecological sensitivity and integrity of the site and the immediate surrounds; ▪ Provide a discussion on the applicable legislation and policies; ▪ Highlight the opportunities and constraints associated with the proposed development. ▪ Compiling suitable maps, illustrating pertinent biophysical attributes of the area and surroundings; and ▪ Presenting mitigation measures for each identified environmental constraint.

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ENVIRONMENTAL MAINTENANCE MANAGEMENT PLAN

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DEFINITIONS

Aspect	Definition
Activity (Development)	An action either planned or existing that may result in environmental impacts through pollution or resource use. For the purpose of this report, the terms 'activity' and 'development' are freely interchanged.
Alternatives	Different means of meeting the general purpose and requirements of the activity, which may include site or location alternatives; alternatives to the type of activity being undertaken; the design or layout of the activity; the technology to be used in the activity; and the operational aspects of the activity.
Applicant	The project proponent or developer is responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.
Biodiversity	The diversity of animals, plants, and other organisms found within and between ecosystems, habitats, and the ecological complexes.
Construction	The building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.
Environment	In terms of the National Environmental Management Act (NEMA) (No 107 of 1998) (as amended), "Environment" means the surroundings within which humans exist and that are made up of: i. The land, water, and atmosphere of the Earth. ii. micro-organisms, plants, and animal life. iii. any part or combination of (i) or (ii), and the interrelationships among and between them; and iv. d) the physical, chemical, aesthetic, and cultural properties and conditions of the foregoing that influence human health and wellbeing
Environmental Assessment	The generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.
Environmental Authorisation	An authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.
Environmental Assessment Practitioner (EAP)	The individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.
Environmental Management	Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the

Aspect	Definition
	carrying capacity of the environment.
Groundwater	Water in the ground that is in the zone of saturation from which wells, springs, and groundwater run-off are supplied.
Hydrology	The Science encompasses the behaviour of water as it occurs in the atmosphere, on the surface of the ground, and underground.
Important areas	Sites that are important for the conservation of biodiversity in Gauteng (Gauteng C-Plan Version).
Irreplaceable areas	Sites, which are essential in meeting targets set for the conservation of biodiversity in Gauteng (Gauteng C-Plan Version 3)
Maintenance	Means actions performed to keep a structure or system functioning or in service at the same location, capacity and footprint
Maintenance Management Plan	Means a management plan for maintenance purposes, defined or adopted by the competent authority.
Mitigate	The implementation of practical measures designed to avoid, reduce, or remedy adverse impacts or enhance beneficial impacts of an action.
No-Go Option	In this instance, the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.
Sensitive Environments	Any environment identified as being sensitive to the impacts of the development
Sustainable Development	Development that meets the needs of current generations without hindering future generations from meeting their own needs.
The Act	Means the National Environmental Management Act, 1998 (Act No 107 of 1998)
Undeveloped	Means that no facilities, structures or infrastructure have been developed upon the land or property during the preceding 10 years
Urban areas	Means areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined of adopted, it refers to areas situated within the edge of built-up areas
Vacant	Means not occupied for the purpose of its lawful land use during the preceding ten-year period
Watercourse	Means i. a river or spring. ii. a natural depression in which water flows regularly or intermittently. iii. a wetland, lake or dam into which, or from which, water flows. iv. and v. (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 bank
Wetland	Means land which is transitional between terrestrial and aquatic systems

Aspect	Definition
	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 circumstances supports or would support vegetation typically adapted to life in saturated soil

Abbreviations (Definitions are above):

AIP	Alien and Invasive Plant
CBA	Critical Biodiversity Area
CoT	City of Tshwane Metropolitan Municipality
C	Contractor
DEO	Designated Environmental Officer
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
GDEnv	Gauteng Department of Environment
I&APs	Interested and / or Affected Parties
PC ELO	Environmental Liaison Officer
MMP	Maintenance Management Plan
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
PC	Principal Contractor
PM	Project Manager
SAHRA	South African Heritage Resource Agency
SM	Site Manager
SO	Safety Officer
WMA	Water Management Are

SECTION 1 - INTRODUCTION AND BACKGROUND OF THE PROJECT

1 INTRODUCTION

Selahle Consultancy and Projects Pty Ltd was appointed by Imbawula Civil Projects on behalf of the City of Tshwane Metropolitan Municipality (herein referred to as the City), to assist in undertaking environmental studies for the Maintenance and Upgrade of Existing stormwater lines and manholes for the construction of BRT Line 3 at Prince's Park Avenue and Bus Stops/Bays along WF Nkomo Street, Pretoria, Gauteng Province.

The proposed environmental assessment project falls within the ambit of a Maintenance Management Plan (MMP) under the EIA Regulations, 2014 (as amended). This MMP has been compiled primarily to meet the requirements of Section 28 of NEMA, which relates to the duty of care and remediation. Moreover, the MMP has been undertaken in accordance with environmental best practices and responsible development for the Maintenance and Upgrade of existing stormwater lines and manholes for the construction of BRT Line 3 at Prince's Park Avenue and Bus Stops/Bays along WF Nkomo Street, Pretoria, Gauteng Province.

Section 24(b) of the Constitution of the Republic of South Africa Act (Act No. 108 of 1996) states that “everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation [and] promote conservation”. This is the statutory framework that promulgated the National Environmental Management Act (No. 107 of 1998, abbreviated NEMA). This Act was assented to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, and procedures for co-ordinating environmental functions exercised by organs of state; to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and to provide for matters connected therewith.

This Act (NEMA) incorporates other Environmental Management Acts, such as the National Environmental Management: Waste Act (No. 59 of 2008), to mention but a few. This Act regulates the Norms and Standards for Waste generated in South Africa and categorises it into either general or hazardous waste.

Furthermore, EIA Regulations were promulgated under the National Environmental Management Act, 1998, in 2006. These regulations were aimed at streamlining and aligning potential environmental projects that were envisaged in the country, to determine if the project is a Basic Assessment and/or a Scoping or Environmental Impact. These EIA Regulations were then reviewed every four years and promulgated thereafter.

The MMP is a detailed plan for the implementation of the mitigation measures to minimise the negative environmental impacts. The provisions of this MMP are binding on the contractor during

the life cycle of the contract. The MMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification.

2 PROPOSED ACTIVITY

2.1 Brief Project Background

The City of Tshwane's A Re Yeng (Let's Go) Tshwane Rapid Transit (TRT) system is intended to form the backbone of an integrated rapid public transport system/network (IRPTN). The CoT aims to use the bus rapid transit system to provide a world-class public transport service for current public transport users, with the long-term objective of converting private vehicle users to the new system. This will reduce the use of private cars on the City's Road network and relieve traffic congestion on the major arterials and highways. The Bus Rapid Transit (BRT) system will thus be the "main catalyst" by which to achieve a 70:30 ratio of public transport to private transport.

The BRT Line 3 Section 1 stretches from the Pretoria CBD to Pretoria West. However, the current project focuses on the widening and upgrading of Prince's Park stormwater system and roads, which is approximately 500m in length. The site can be accessed via W.F. Nkomo Street (formerly Church Street) and Prince Park Street.

3 SCOPE OF WORKS

The scope of works for the Maintenance and Upgrade of Existing stormwater lines and manholes for the construction of BRT Line 3 at Prince's Park Avenue and Bus Stops/Bays along WF Nkomo Street entails:

- Removing the existing layer works on Prince's Park Avenue
- Reusing some of the material obtained from the box cutting
- Road widening, which may include removing and relocating trees, bollards and park furniture
- Relocation and protection of underground services
- Upgrading of the existing stormwater network
- Upgrading of existing bus bays and bus stops
- The upgrading of the existing sidewalks to support Non-Motorised Transport (NMT).
- Accommodation of traffic during the construction stage
- Upgrading of the existing streetlights on Princess's Park Avenue
- Replacement of non-working streetlights along Nkomo Street

The scope is limited to the Stormwater Outlet Works in the vicinity of manhole MH01A along W.F. Nkomo Street (Church Street) and the associated daylight/outfall detail at the embankment. The maintenance work will not increase hydrological loading to the receiving stream.

The contributing catchment area(s) to the outlet remain unchanged, and no additional upstream connections were introduced. The deviation relates to outlet configuration and pipe diameter only.

For urban road catchments, stormwater designs typically adopt a conservative runoff coefficient (C ≈ 0.8) for paved surfaces; accordingly, the minor surfacing adjustments associated with the road reserve widening do not alter the design inflow assumptions. On this basis, the peak discharge to the receiving stream is not expected to increase relative to the historical baseline; the upgrade improves conveyance reliability under the same hydrological loading.

During construction and rehabilitation works, unforeseen site conditions were encountered, including the discovery that the existing Ø375 mm stormwater outlet pipe was materially obstructed and hydraulically deficient. Reinstating the pipe in its original configuration would have resulted in reduced hydraulic capacity, increased risk of surcharge and surface flooding, and ongoing maintenance challenges.

To restore functionality and ensure compliance with the City of Tshwane Stormwater Standards (minimum stormwater pipe diameter requirements (≥ Ø450 mm), the outlet was upgraded to a Ø525 mm diameter pipe. This intervention improves conveyance reliability, reduces blockage risk, and ensures long-term serviceability of the stormwater system. Importantly, the contributing catchment area remains unchanged, and no additional upstream connections were introduced. As such, the deviation does not increase stormwater inflows or peak discharge to the receiving environment but rather improves the safe and controlled conveyance of existing runoff. The affected road functions as a high-traffic route with significant public transport usage. The selected deviation minimised construction duration and footprint, avoided full road closures, and ensured continuity of traffic and public transport services, thereby maintaining public safety.

For ensuring that the installation of a stormwater line with a diameter of 525 mm from the planned joint manhole to the proposed discharge point is coordinated appropriately and does not compromise the environmental characteristics surrounding the in-points during the construction process. This method statement entails the construction of the stormwater line from the planned joint manhole to the proposed discharge point for the 525 mm diameter pipes. The stormwater line is approximately 57 metres in length, and the calculated discharge velocity = 0.47 m/s, at a flow rate of 0.89 $m3/s$.

4 PROJECT BACKGROUND

4.1 Project Location

The BRT Line 3 Section 1 stretches from the Pretoria CBD to Pretoria West. However, the current project focuses on the widening of the road, which is approximately 500m in length and the upgrading of Prince's Park stormwater system. The study area is located within Portion 6 and 14 of the Farm Pretoria Town and Townlands 351 JR. The site can be accessed via W.F. Nkomo Street (formerly Church Street) and Prince Park Avenue within the City of Tshwane Metropolitan Municipality. Below are the tables with the site coordinates:

Table 1: Coordinates of the Road

Road Name	Start Point	Middle	End Point
Princess Park Ave	25°44'50.0"S 28°10'42.1"E	25°44'57.2"S 28°10'42.7"E	25°45'05.2"S 28°10'43.3"E

Table 2: Coordinates of the stormwater pipeline and manhole

Pipeline coordinates	Manhole coordinates
25°44'50.23"S 28°10'39.28"E	25°44'50.24"S 28°10'39.37"E

Figure 1: Google Earth Locality Map showing the study areas

4.2 Site Images – Existing Infrastructure

Figure 2: Photographic records of the outlet vicinity near MH01A prior to full exposure, indicating the available working corridor, existing cover slabs/structures, and proximity to the vegetated embankment and receiving environment.

5 DESCRIPTION OF THE ENVIRONMENT

According to the Gauteng C. Plan 4.0, the proposed route is located within Zone 1 of the GPEMF. A portion of the proposed pipeline falls within a river and wetland and their buffers, within CBA -1 and within the Marikana Thornveld vegetation.

5.1 Climate and Temperature

According to the Weather Atlas (2024), Pretoria enjoys a Humid subtropical, dry winter climate known scientifically as the Cwa classification under the Köppen climate classification. Typically, this means that Pretoria grapples with a spectrum of varying weather conditions throughout the year, exhibiting both heavier rainfall and dry spells. Annual temperatures fluctuate between a high mark of 28.7°C (83.7°F), usually prevalent in January, to a low of 6.9°C (44.4°F) in July. Aligned with the global patterns, summer months are generally warmer, while the winter months tend to be colder. Relative humidity also oscillates, demonstrating a higher prevalence in the summer months (62% in January) and a slight dip in drier months (down to 35% in September). Similarly, variations in daylight hours range from 10.5 hours in June to 13.7 hours in December.

The uniqueness in Pretoria's weather manifests in its rainfall patterns. The city experiences a rainfall peak in January with 92mm (3.62"), while July is the driest month, showing no rainfall at all. This rainfall pattern corresponds with a broad shift in the number of rainfall days, which increases from 1.1 days in July to 21.5 days in January.

5.2 Geology and Soils

The study area falls within the Transvaal System and, more specifically, the Pretoria Series. The group is primarily underlain by quartzite, shale, hornfels, calcareous layers and agglomerate. It can be expected that there are silty clayey deposits in the flood plains and stream beds of the rivers (streams) crossing the area.

5.3 Vegetation

The surrounding area is located within Marikana Thornveld (SVcb 6), which is characterised by an open Acacia karroo woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitats protected from fire.

The vegetation group has a conservation status of Endangered, with a conservation target of 19%. Only less than 1% statutorily conserved in, for example, in the Magaliesberg Nature Area. More conserved in addition in other reserves, mainly in the De Onderstepoort Nature Reserve. Considerably impacted, with 48% transformed, mainly cultivated and urban or built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land transformation. Erosion is very low to moderate. Alien invasive plants occur locally in high densities, especially along the drainage lines.

Based on the site assessment, the proposed project (roads and stormwater upgrades) will be undertaken on an already transformed area (i.e. the existing road), located within the Pretoria Area. No indigenous vegetation and wild fauna were noted during the site inspection. Moreover, the likelihood of the rare and/or endangered species occurring onsite is very unlikely due to the transformed state of the proposed site. Accordingly, no natural vegetation will be affected (either removed or disturbed) by the proposed project.

5.4 Hydrology

The site is located on the boundary of A23A Quaternary Catchment, which is located within the Limpopo River Catchment Management Area managed by the Department of Water and Sanitation – Northwest Region. According to the Gauteng Conservation Plan and National Environmental Screening Tool, there are two (2) identified watercourses in the greater area, with the closest NFEPA located approximately 1500m from the proposed site. However, there is a drainage line closer to the proposed area, located approximately 80m from the site.

5.5 Topography

The topography of the site is characterised by flat to gentle slopes where the elevation decreases gradually, ranging from 1320 m to 1310 m above sea level. See Figure 3 below for the site's elevation.

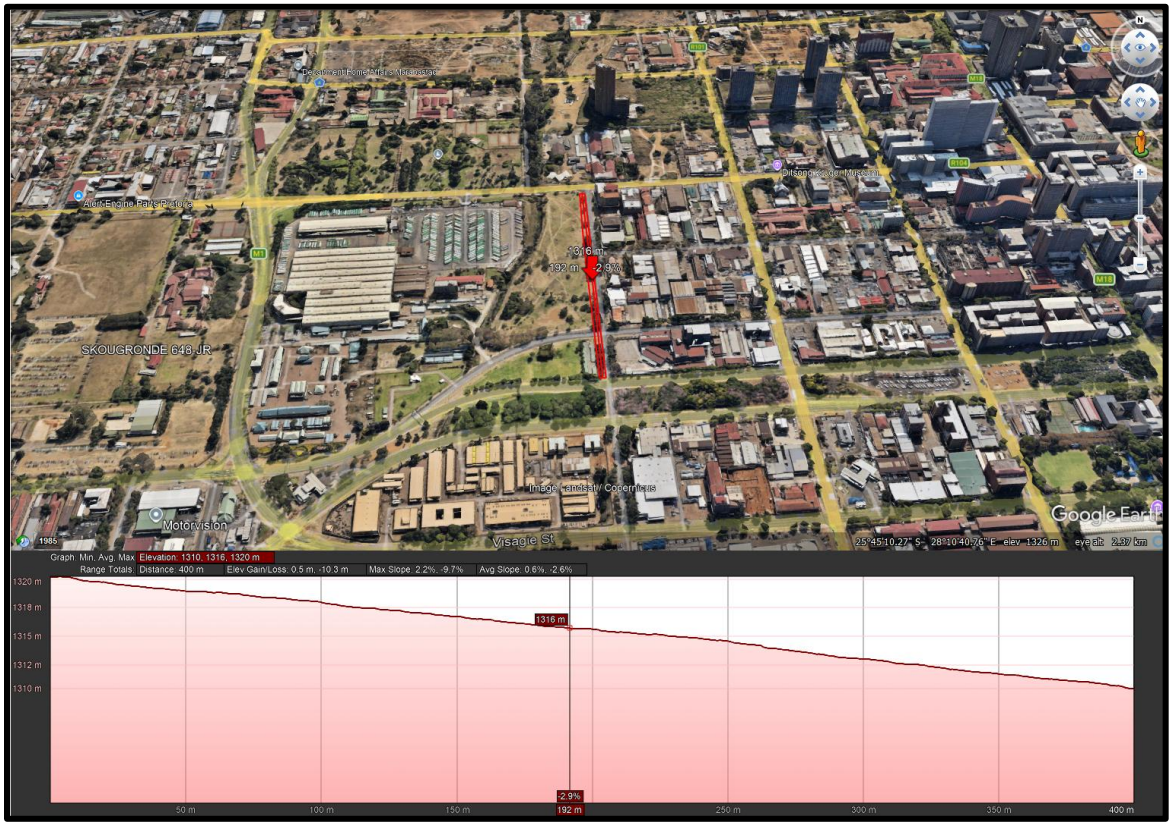


Figure 3: Elevation Map for the route

5.6 Land-Use

The project area is located within a predominantly urban and built-up environment along Prince's Park Avenue and WF Nkomo Street within the City of Tshwane Metropolitan Municipality, Gauteng Province. The surrounding land uses are characterised by a combination of transportation infrastructure, commercial activities, institutional facilities, and associated municipal services infrastructure.

The project corridor primarily traverses existing road reserves associated with the BRT Line 3 transport route and includes existing paved road surfaces, sidewalks, stormwater infrastructure, intersections, traffic management infrastructure, and public transport facilities. The area is highly transformed due to historical and ongoing urban development activities. The proposed study area is surrounded by the following land use features: educational facilities (schools), public open space, local businesses and municipal Roads.

5.7 SOCIAL FACTORS

5.7.1 Heritage Resource

A Heritage Specialist was appointed for the assessment of the impact within the development route. A summary of their detailed findings is as follows:

- The site for the project BRT Line 3 Section 1: Proposed Widening of Prince's Park Avenue and the Development of 16 Bus Stops/Bays Located in Pretoria West, City of Tshwane Metropolitan Municipality, Gauteng Province was investigated during a field visit and through archival studies.
- Church Street Cemetery is located next to the 61 R bus stop. Care should be taken during the upgrade of this stop to not breach the fence of the cemetery.
- Although Pretoria Central has several listed buildings, none of these will be affected by the proposed activities. Apart from the cemetery, the immediate study area was found to be devoid of any heritage sites of significance and severely altered from the natural landscape. It is recommended that obscured, subterranean sites be managed if they are encountered.

5.7.2 Palaeontological sensitivity

The palaeontological sensitivity map was extracted from the SAHRIS database and clearly indicates Moderate (Green) as indicated in Figure 4 below. As a result, a field assessment is required should the proposed roads and stormwater system upgrade be expanded to the virgin/untransformed areas surrounding the area.

Figure 4: Palaeo sensitivity Map for the project area

SECTION 2: PURPOSE OF THE MAINTENANCE MANAGEMENT PLAN

6 PURPOSE OF THE MAINTENANCE MANAGEMENT PLAN

This document is applicable to the current construction/maintenance activities, including future maintenance activities related to the maintenance of the Prince's Park stormwater system.

The aim of this MMP is a guiding framework to manage and maintain the proposed maintenance and rehabilitation activities timeously, effectively, sensitively, and in accordance with applicable legislation.

This MMP serves to identify the required management prescriptions for the successful maintenance and replacement of the stormwater pipeline and manhole. The overall purpose of the MMP is to prescribe principles and management methods necessary for the avoidance, prevention or mitigation of adverse environmental impacts undertaken during maintenance work.

The MMP has the following objectives:

- Ensure compliance with the necessary legislative framework;
- Identifying construction activities that might have detrimental impacts on the environment;
- To promote the construction and maintenance of the manholes and stormwater pipeline in an environmentally sensitive manner;
- To promote the widening and maintenance of the road in an environmentally sensitive manner
- To minimise management commitments by providing vegetation that regenerates naturally, and which stabilises disturbed soil around the development;
- To reduce soil erosion and the instability of the surrounding environment;
- To minimise impacts on the river crossings, during the construction, operation and maintenance of the infrastructure;
- To enhance the visual amenity of the area by providing the best mitigation measures to reduce flooding of the river;
- To outline mitigation measures for construction activities that might have detrimental impacts on the environment;
- To assign roles and responsibilities to parties regarding the implementation of the MMP; and
- To establish a procedure for environmental monitoring and auditing of rehabilitation work.

It is also important to acknowledge that this MMP should be dynamic and reviewed on a regular basis to assess the success of the implemented inventions in maintaining the integrity of the area, as well as to address any shortcomings and make the necessary improvements.

Moreover, the City is mindful that this MMP does not absolve it from the general "Duty of Care" set out in Section 28(1) of the NEMA, viz.: "***Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable***

measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution nor degradation of the environment".

7 IMPLEMENTATION OF THE MMP

7.1 Practical Application

A clear understanding is needed of the risks to humans and the natural environment, the effectiveness and the consequences of the various management decisions that are made during the construction and maintenance phase of the development. At all construction, rehabilitation and maintenance sites, the primary goal is to mitigate the impacts of development in as environmentally sensitive a manner as possible.

The following aspects are considered central to a successful implementation of MMP:

- Identification of causal mechanisms:
  - Determining the cause of the deterioration and whether it has resulted from natural occurrences or anthropogenic activities.
  - Where human impact is the cause, it should be assessed whether the harmful actions are ongoing and if the prevention or control of such actions is possible.
- Design of rehabilitation/correction measures
  - Identify strategies to remove or control as far as possible the cause of the degradation.
  - With an understanding of the causal mechanisms, identify management interventions, such as the type of earthmoving machinery, vegetation, and the various species to be planted, etc.
  - Timely allocation of the budget.
- Implementation/Rehabilitation
  - Reinstating and re-vegetation of all disturbed areas (including grasslands).
  - Public consultation through a media statement and informing the local Ward Councillor, etc.
- Maintenance and monitoring
  - To ensure that rehabilitation is a success, maintenance must be ongoing; periodical inspections and evaluations must be conducted until a satisfactory level of vegetation cover is reached.

7.2 Non-compliance with the MMP

Operational difficulties may be encountered that may result in non-compliance. Non-compliance may arise due to poor communication across the City's various line departments, staff turnover, budget shortfalls, logistical challenges, etc. The city must put in place measures to ensure that the various departments will remain compliant with the MMP as far as possible.

Non-compliance with the MMP will be logged, and a report compiled on each non-compliance event will be submitted to the Gauteng Department of Environment (GDEnv) for auditing purposes.

7.3 Amendment to the MMP

No MMP amendments (relaxation or revision of any mitigation measure or procedural requirements) will be allowed without approval from the Gauteng Department of Environment (GDEnv). Motivations for amendments must be placed in writing and submitted to the Department for consideration.

SECTION 3: ENVIRONMENTAL LEGISLATION CONSIDERED AND TRIGGERED LISTED ACTIVITIES

8 LEGISLATIONS TO BE CONSIDERED

The following environmental legislations were taken into consideration in the development of this MMP:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996);
- National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended;
- Listing Notices 1, 2 & 3 of the Environmental Impact Assessment Regulations 2014 as amended;
- Gauteng Maintenance Management Plan Guideline
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) as amended;
- National Water Act, 1998 (Act No. 36 of 1998);
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004);
- National Environment Management: Biodiversity Act, 2004 (Act No. 10 of 2004);
- National Heritage Resources Act, 1998 (Act No. 25 of 1999);
- Conservation of Agricultural Resources Act, 1998 (Act No. 43 of 1983);
- National Forest Act, 1998 (Act No. 30 of 1998); and
- Hazardous Substances Act, 1973 (Act No. 15 of 1973).
- Gauteng Conservation Plan 4.0
- GDARD Minimum Requirements for Biodiversity Assessments, 2014
- SANS Standards
- Occupational Health and Safety Act, 1993 (Act No.85 of 1993)
- ISO Standards (45001:2018 and 14001:2015)
- Municipality By-Laws and Policies.

8.1 Triggered Activities

The listed activities that are triggered by the proposed development in terms of the EIA Regulations, 2014 (as amended) are:

Listing Notice 1: Activity 19:

The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving – **is for maintenance purposes undertaken in accordance with a maintenance management plan**".

Applicability of the activity – The replacement of the stormwater pipeline will entail removing and depositing of soil into the watercourse.

Listing Notice 3: Activity 12: *(c)* (i) (ii)

The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for **maintenance purposes undertaken in accordance with a maintenance management plan**". Type of Environmental Feature
The proposed project maintenance activities will occur in a Critical Biodiversity Area. The environmental attributes that fall within the ambit of the GMMPG as derived from the above-mentioned Listing Notices are:

- Watercourse (i.e., wetlands and rivers or any other natural waterbody that falls within the definition of a watercourse) as defined in the EIA Regulations, 2014 (as amended).
- Indigenous vegetation as defined in the EIA Regulations, 2014 (as amended).

Applicability of the activity – The maintenance activities will entail clearance indigenous vegetation from an area of more than 300 square metres.

9 PUBLIC PARTICIPATION PROCESS

The Public Participation Process is not mandatory to be undertaken during an MMP adoption process; however, the following will be undertaken to notify relevant parties that might be affected by the maintenance works:

- Relevant stakeholders, including road users as well as the municipality, will be notified of the activities.
- Site notices will be erected around and along the study area.
- The Draft MMP report will be placed at the City of Tshwane Library and at the Construction Site Camp for a period of 30 days.

SECTION 4: MAINTENANCE MANAGEMENT PLAN ACTIVITIES

All planned activities that would be undertaken during the maintenance phase will have detrimental impacts on the environment and the watercourse. This Maintenance Management Plan will duly address the potential impacts as well as the mitigation measures thereof.
All potential impacts that may be caused by the proposed development will be identified using the following media:

- Existing information.
- Site visit with the project team; and
- Legislation.

The assessment methodology that would be used in assessing and mitigating these impacts is shown in the table below:

Table 3: Methodology utilised in the rating of significance of impacts

NATURE
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.
The potential impacts of the proposed development were identified through a desktop study, a site verification, and specialist studies. In the Maintenance Management Plan, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts. In general, it is recognised that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, these possible risks must be taken into account during the planning phase of the development. Risks and key issues were identified and addressed through an internal process based on similar developments and an environmental evaluation. Previous experience has shown that it is often not feasible or practical to only identify and address possible impacts. The rating and ranking of impacts are often a controversial aspect because of the subjectivity involved in attaching values to impacts. Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.
GEOGRAPHICAL EXTENT
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.

1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the environmental parameter. A cumulative effect/impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY/ MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.

4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

SIGNIFICANCE

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value by the magnitude/intensity, the resultant value acquires a weighted characteristic that can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

9.1 Summary of Impacts Associated with the Proposed Project

Several potential impacts were identified on the environment that may be associated with the proposed maintenance of infrastructure. The identified impacts and their significance are rated before and after mitigations.

Table 4: Summary of impacts and their significance before and after mitigation

IMPACT	SIGNIFICANCE (before mitigation)	SIGNIFICANCE (after mitigation)
MAINTENANCE PHASE		
Loss of vegetation	**Medium –**	**Low –**
Spread of alien and invasive plant species	**High –**	**Low –**
Increase in stormwater and soil wash, leading to sedimentation of water resources and erosion	**High –**	**Low –**
Removal of SCC	**Medium**	**Low**
Employment Creation and Local Business Development	**Low +**	**Medium +**
OPERATIONAL PHASE		
Change in the flow regime	**Medium –**	**Low –**
Reduction of water for the downstream environment	**Medium –**	**Low –**
Erosion, Sedimentation, and Potential Pollution of Watercourses	**High –**	**Low –**
Prevention of Flooding	**Medium -**	**Low -**
Maintenance of Infrastructure	**Medium +**	**High +**
Employment Creation and Local Business Development	**Low +**	**Medium +**

10 ENVIRONMENTAL METHOD STATEMENTS

The Method Statements may comprise the way in which the plan is to be set out, materials handling and storage, the use of labour, and the method that the Contractor proposes to use to carry out an activity. The Method Statement must include sufficient details so that the ECO and Project Manager can assess whether the Contractor's proposal is in accordance with the requirements of the Environmental Maintenance Management Plan and good environmental practice. The Contractor must sign each Method Statement, along with the ECO, the Project Manager, and/or the Proponent, to formalise the approval of the documents.

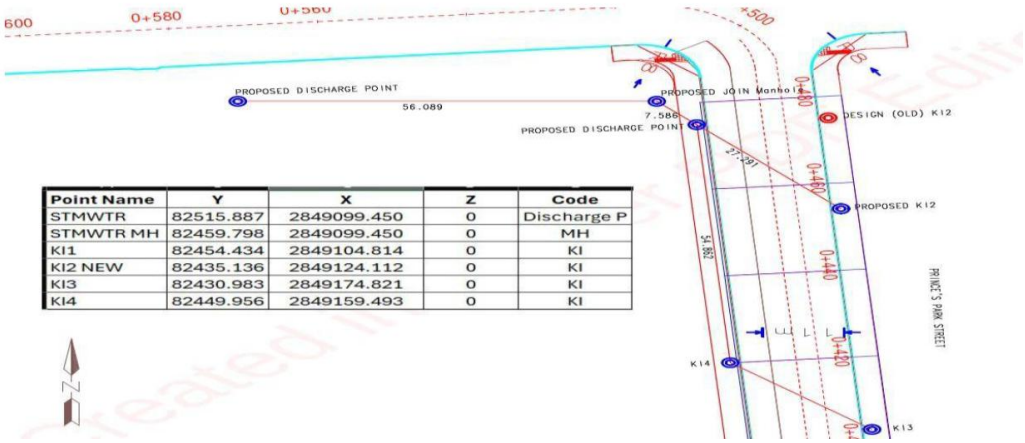
A Method Statement is a “live document” in that modifications are negotiated between the Contractor and the ECO or project management team, as circumstances unfold. A Method Statement describes the scope of the intended work in a step-by-step description for the ECO to understand the Contractor’s intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impact during these tasks. A Method Statement indicates the following:

What - a brief description of the work to be undertaken;
How - a detailed description of the process of work, methods and materials;

Where - a description/sketch map of the locality;
When - the sequencing of actions with due commencement dates and completion date estimates;
Who – the person responsible for undertaking the works described in the Method Statement.

Table 5: Summary of the Environmental Methods Statement and Control Measures

1. **Activity** - The BRT Line 3 Section 1 stretches from the Pretoria CBD to Pretoria West. However, the current project focuses on the widening and upgrading of Prince's Park stormwater system and roads, which is approximately 500m in length. 2. **Relevant Site Characteristics** – The site is characterised by CBA and a canalised stream/drainage line.
3. **Materials and Equipment** ▪ Excavator ▪ TLB ▪ 525 mm Pipes (Approximately 57 metres) ▪ G6 material (Bedding) ▪ Rammer compactors x 4 ▪ Fishline ▪ Gauging rode ▪ Dumpy level set ▪ Line marker ▪ Hand tools 4. **Method** ▪ Exposing of Existing Services – Hand excavation ▪ Demolishing of Existing structures i.e. Manholes, Stormwater pipes. ▪ Site Clearance – Removal of debris and clearing working area. ▪ Removal of vegetation – Removal and Preserving topsoil. ▪ Surveying: Levels Setting Out ▪ Excavation: Trench excavation ▪ Bedding – processing and preparation of bedding layer ▪ Compaction tests – Density tests ▪ Pipe laying – Horizontal and Vertical alignment ▪ Backfilling – Filling the cover layer for the 525 mm storm water pipe ▪ Tests & Inspections - Conduct tests and inspections to verify that the constructed stormwater line pipe is constructed within the Tshwane Standards and Specifications.
5. **Layout**



Point Name	Y	X	Z	Code
STMWTR	82515.887	2849099.450	0	Discharge P
STMWTR MH	82459.798	2849099.450	0	MH
KI1	82454.434	2849104.814	0	KI
KI2 NEW	82435.136	2849124.112	0	KI
KI3	82430.983	2849174.821	0	KI
KI4	82449.956	2849159.493	0	KI

Figure 5: Proposed replacement of the K12 New stormwater pipeline

6. Method statements	7. Control measures
a) Site and vegetation clearance. b) Exposing of Existing Services – Hand excavation. c) Demolishing of Existing structures i.e. Manholes, Stormwater pipes. d) Excavation: Trench excavation	▪ Minimise the spatial extent of disturbance and the frequency of, or requirement for, maintenance activities. The disturbance footprint should be clearly demarcated. No activities should take place outside of this area. ▪ Repairs should be conducted during the dry period when there is low or no flow in the river. Any flow in the watercourse should be diverted around the river works and the minimum base flow in the river should be maintained at all times. ▪ Do not impede the movement of aquatic and riparian biota through construction of fences, walls or trenches within the riverine corridor. ▪ Manual labour is preferred to the use of mechanical equipment in order to minimise physical disturbance around the activity location. ▪ Any cleared sediment, vegetation or spoil material associated with the maintenance activity should be removed out of the river channel, to an approved disposal site. ▪ After construction, any areas within the maintenance footprint that have been degraded from their condition prior to construction and as a result of the maintenance activities must be restored to their former condition. If required, disturbed areas should be revegetated with appropriate indigenous plant species). ▪ Removed material should be taken out of the channel completely and should not be utilised to block the river flow or

	to create berms on the top of the stream banks. ▪ Disturbed areas on the banks of the river should be revegetated with indigenous plant species. ▪ Avoid trampling or clearing of indigenous vegetation by using established paths where possible. ▪ Clear felled alien vegetation should be removed from the river corridor. Larger tree stumps can be left to minimise erosion of the cleared area ▪ Where necessary revegetate cleared areas with suitable indigenous vegetation. ▪ Ongoing monitoring and clearing of regrowth of alien plants within these areas will be required. ▪ It is recommended that weekly monitoring for alien vegetation regrowth be conducted. ▪ Should chemicals be used, only those that are not harmful to soil bacteria and aquatic biota should be used. The type of chemicals used, date and location of application must always be recorded in the monthly reports to be prepared by the conservator. ▪ Kikuyu grass shall be sprayed, using Focus Ultra (preferable to Roundup near surface or groundwater resources), prior to construction. Spraying should preferably occur during the autumn, but if this is not possible, a follow-up spray should be done in the autumn following the original spraying. Dead grass can then be removed by hand. ▪ Apart from the spraying of kikuyu described above, it is not recommended that herbicides or pesticides be sprayed within the riverine corridor, or within 100m of these areas, or of any of the stormwater channels. ▪ No highly persistent pesticides or herbicides will be purchased or used. ▪ The storage and handling procedures specified by the manufacturer of the chemical must be followed. ▪ Chemical application should be avoided on windy days and before heavy rains. ▪ Disturbed or cleared areas should be revegetated with indigenous plant species.
a) Surveying: Levels Setting Out b) Compaction tests – Density tests c) Bedding – processing and	▪ The Surveyor must ensure that at all times the setting out/survey data is compliant with the requirements for setting out of plan data onto the ground or for the collection of ground data and displaying such data on a plan by applying the correct scale and height above sea level corrections. ▪ Compaction testing should evaluate the percentage to which

preparation of bedding layer	soil has been compacted to reduce voids and increase density. ▪ Compaction is vital for enhancing the soil's load-bearing capacity, reducing settlement, and improving resistance to water infiltration. Compacted soil provides a stable foundation, minimising the risk of structural failure.
Pipe laying – Horizontal and Vertical alignment	▪ Material may be removed within the active channel only during the dry season
Backfilling – Filling the cover layer for the 525 mm storm water pipe	▪ Planting should be done in zones, the river margin which is permanently wet, the lower banks which are seasonally wet, the middle banks which are temporarily wet and the upper banks which are dry to temporarily wet (Figure 11 of Annexure E: Freshwater Assessment). ▪ Planting must be done in late April/early May, in order to avoid the hot summer months and be in time to catch the light early winter rains. d) Where necessary, top material can be spread on the river banks. This must be sought from a suitable source, and be of the right type (texture, pH, etc) for this area, and be free of weeds. ▪ All areas disturbed or compacted during maintenance-related activities and which are destined to be planted should be loosen to a depth of 300mm. ▪ Previously cleared top material should be replaced or new (from verified source and not containing alien seed) top material brought in, after which the areas will be replanted.
Tests & Inspections - Conduct tests and inspections to verify that the constructed stormwater line pipe is constructed within the Tshwane Standards and Specifications.	▪ The newly constructed stormwater pipeline must be verified through checking for pipeline alignment, structural integrity and hydraulic capacity against the City of Tshwane's Civil engineering guidelines.
8. Emergency/disaster incident and reaction procedures.	
Emergencies happen due to a variety of reasons or events including: ▪ Natural disasters/ accidents (e.g. floods, windstorms, droughts, earthquakes),	▪ Implement climate change resilient designs. ▪ Implement detailed planning and budgeting during design phase. ▪ Routine inspection, monitoring, and preventative maintenance programmes should be established to identify leaks and defects. ▪ Operational risks can be mitigated by appointing qualified personnel, providing regular training, and establishing standard operating procedures.

▪ Inappropriate or poor design and planning (e.g. inappropriate budgeting) ▪ System neglect or poor maintenance. ▪ Poor operations (e.g. use of incompetent skilled staff) ▪ Vandalism (e.g. pipe breaks) ▪ Exposure of pipes above the ground	▪ Implement security measures such as fencing, surveillance, restricted access, and patrols to reduce vandalism and theft. ▪ Where possible, bury pipelines or protect them with casings to minimise damage. Additionally, develop emergency response plans for quick action during spills or pipe failures.

11 ROLES AND RESPONSIBILITIES FOR MMP IMPLEMENTATION

The roles and responsibilities are listed as follows:

- The Applicant/Client – the client is responsible for employing the Principal Agent and Contractor for the duration of the maintenance work. They, in turn, will employ the ECO.
    - The client will also ensure, as a signatory to the MMP, that the Principal Agent and Contractor fulfil their obligations in terms of this MMP.
- Principal Agent (if required) – the Principal Agent is appointed by the client and is responsible for ensuring that the maintenance work is carried out to completion on time, within budget and that the Contractor fulfils their obligations in terms of the MMP.
    - The Principal Agent and ECO are expected to develop a close working relationship and to communicate frequently.
    - The Principal Agent must be recognised as the senior authority on site, and all communications and instructions between the ECO and the Contractor must occur via the Principal Agent.
    - The Principal Agent is also responsible for deducting environmental penalties from the Contractor.
    - The Principal Agent must ensure that the Contractor has a copy of this MMP and all approved Method Statements and that the Contractor is familiar with the relevant documentation.
- ECO – The ECO will advise the Principal Agent and Contractor of any environmentally related issues during the maintenance phase of the development.
    - The responsibilities of the ECO will include monitoring of compliance with the MMP by the Contractor (if appointed).
    - The ECO has the authority to recommend the cessation of works or any portion of the maintenance activity to the Principal Agent. This will be triggered if, in his/her opinion, the activity has caused or will imminently cause significant damage and/or harm to the environment or is in contravention of the relevant

environmental legislation/permits/authorisations applicable to the site and/or activity/ies.

- If the Contractor fails to show adequate consideration to the MMP or the recommendations of the ECO, then the ECO may recommend that the Contractor's representative or any employee/s responsible for not showing adequate consideration to the MMP be removed from the site. Alternatively, the ECO may recommend that all maintenance work on site be suspended until the matter is remedied. All costs will be carried by the Contractor.
- Should modifications to this document be required, these must be agreed to by all parties concerned.

- The Contractor – the Contractor will adhere to the conditions of this MMP and ensure that all of its sub-Contractors, employees, suppliers, agents and so forth, for whom the Contractor is fully responsible for their actions on site, are fully aware of this MMP, its requirements and the consequences of any breach of the requirements of this MMP. The Contractor is fully responsible for implementing the MMP.

The Contractor will ensure that works on site are conducted in an environmentally responsible manner and in accordance with the requirements of this MMP.

12 REPORTING

12.1 Documentation

12.1.1 Complaints/Incident Registers

The Contractor shall be responsible for responding to the ECO in writing with respect to queries and/or complaints relating to construction activities. The Contractor shall notify the ECO of any complaints being lodged by a third party (e.g. members of the public, registered I&APs, neighbouring landowners, etc.). The Contractor shall be responsible for maintaining a complaints register in which all complaints and corresponding actions taken are recorded. This register shall be made available to the Project Manager and/or ECO/ESO on request. The complaints register must be kept in the site office and must always be available to the ECO/ESO and/or the applicable officials. All complaints received must be investigated, and a response shall be given to the complainant within seven (7) days. The following information must be provided:

- Name, time, date, location and nature of the incident/complaint lodged;
- Date and method of letting the ECO/ESO know of such incident/complaint lodged; and
- The description of the actions taken to mitigate such incident/complaint lodged, date of such actions taken and by whom.

12.1.2 Emergency Preparedness Procedure

The Contractor shall ensure that there is an emergency preparedness procedure on site before commencing with activities. The Contractor must ensure that site staff are familiar with all

emergency procedures to be followed and must ensure that the list of all emergency telephone numbers/contact people is kept up to date and that all numbers and names are posted at the site office at all times. The Contractor shall appoint a Safety, Health and Environmental (SHE) Officer to conduct environmental and health & safety audits at the required intervals. All environmental, health, and safety incidents occurring on the site must be recorded in an environmental, health, and safety incidents report.

The following information, as a minimum, must be provided:

- Name, time, date, location and nature of the incident;
- The name, time and date of the person contacted to report the incident(s);
- Description of the corrective/emergency actions taken; and
- When corrective/emergency actions were taken and by whom

Furthermore, during the operational phase, the Proponent shall ensure that there is an emergency preparedness procedure that takes cognisance of, amongst others, the following potential emergencies:

  - Sedimentation that can cause blockages, which may lead to flooding in the area
  - Alien and Invasive species overgrowing along and within the stream

12.2 Record Keeping

The engineer and the ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The noncompliance shall be documented and reported to the engineer in the monthly report. These reports shall be made available to the competent authority when requested.

The Contractor shall ensure that an electronic filing system identifying all documentation related to the EMP is established.

A list of reports likely to be generated during the proposed maintenance activities is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Relevant Environmental Approvals
- Final design documents and diagrams issued to and by the Contractor.
- All communications detailing changes of design/scope that may have environmental implications.
- Daily, weekly, and monthly site monitoring reports.
- Complaints register.
- Medical reports.
- Training manual.

- Training attendance registers.
- Incident and accident reports.
- Emergency preparedness and response plans.
- Copies of all relevant environmental legislation.
- Permits and legal documents, including letters authorising specific personnel of their duties as part of emergency preparedness teams, e.g., fire teams, etc.
- Crisis communication manual.
- Disciplinary procedures.
- Monthly site meeting minutes during construction.
- All relevant permits.
- All method statements from the Contractor for all phases of the project.

12.3 Document Control

The Contractor and the resident engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person.
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution.
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for five years.

The Contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the independent external auditor.

13 MITIGATION AND MANAGEMENT SECTION

13.1 Conditions and Monitoring Requirements

This Environmental Maintenance Management Plan and the specifications contained herein shall form part of the Contract Documentation for the Contractor and for all Sub-Contractors. The Contractor shall help ensure that their staff members comply with the plan, with the conditions of approval and adoption contained in the Maintenance Management Plan and other applicable licences/permits. In addition, the construction activities must remain compliant with any additional relevant legislation. The Contractor shall deal with acts of non-compliance or malicious damage

to the environment by any staff member. Failure to do so shall entitle the Project Manager to certify the imposition of a penalty as detailed below.

The Contractor will be considered non-compliant if:

- Is there any evidence of violating the Environmental Maintenance Management Plan or conditions of adoption contained in the MMP and any other license and permits?
- Any environmental damage on site has occurred as a result of negligent construction activities;
- The Contractor fails to comply with any instructions issued by the ECO timeously or by the authorities within the specified timeframes; and
- The Contractor does not sufficiently or timeously respond to public complaints brought to his/her attention by the ECO.

State officials shall be allowed access to the site to assess and monitor environmental compliance at all reasonable times, and all available monitoring and auditing records shall be made available to them for inspection. In addition, copies of the Environmental Authorisation, any relevant permits/licences, and this Environmental Maintenance Management Plan must be available on site at all times.

13.1.1 Penalties

Fines shall be issued for incidents of non-compliance at the discretion of the Project Manager. The penalties issued shall be determined in consultation with the ECO and the Proponent. Non-compliance shall be determined by means of environmental auditing, which will be undertaken by the ECO in terms of the Environmental Maintenance Management Plan. In addition to payment of the penalty, the Contractor responsible for the non-compliance incident shall also be liable for the cost of any corrective action taken to amend the environmental damage that occurred.

13.1.2 Suspension of Works

The Project Manager may instruct the Contractor to remove any person(s) who, in his/her opinion, is guilty of misconduct, or is incompetent, negligent, or constitutes an undesirable presence on site. Where the Project Manager deems the Contractor to be in breach of any of the requirements of this Specification, or if serious non-compliance incidents have taken place, he/she may issue a work stoppage order. The ECO may recommend suspension of works if he/she identifies major non-compliances with the conditions of the EA and/or Environmental Maintenance Management Plan and/or continued minor non-compliances that are not being rectified by the construction team.

During the ongoing operational phase, the ECO may recommend penalties or suspension of certain operations if he/she identifies major non-compliances with the conditions of the EA and/or the Environmental Maintenance Management Plan. The authorities may issue a letter of non-compliance to the Proponent and/or instruct the Proponent to cease all operations on site.

14 CONDITIONS AND MONITORING REQUIREMENTS

Environmental impacts associated with the project, as well as appropriate mitigation measures, have been identified for the environmental attributes of the affected environment, along with more general maintenance-related impacts and accepted mitigation measures. There are several additional management actions that are relevant to this particular site and must be implemented on an ongoing basis, but especially during maintenance activities.

The impact management outcomes described in Chapter 9, together with the impact management actions provided below, will undergo environmental monitoring, especially during any maintenance activities. The monitoring method, frequency and mechanism are provided, together with the responsible person(s) assigned to the particular impact management outcome.

The table below discusses the monitoring method, frequencies, and mechanisms that will be used during the pre-maintenance, maintenance, and post-maintenance phases of the project. This table also includes the designated role and responsibilities assigned for each impact management outcome.

Table 6: Maintenance Management Plan and Mitigation Measures

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
MMP Implementation *Adherence to the MMP conditions is a legal requirement*	Compliance with the MMP and Implementation of the MMP a) The proposed stormwater pipeline and manhole maintenance project shall be carried out in accordance with the adopted "Maintenance Management Plan Report b) Any deviations from the MMP must be approved in writing by the Responsible Authority before commencement of the activity. c) An Environmental Control Officer (ECO) appointed must ensure that provisions of this MMP are fully implemented. d) Non-compliance with the provisions of this adopted MMP will be regarded as a contravention of the underpinning legislation. e) Evidence of Environmental awareness training for all employees must be kept on site. Employees must be fully inducted on the activities' impact on the environment and mitigation thereof.	Project Manager/ ECO/ Contractor	Prior commencement
Management Requirements *The contractor must keep records of all*	Record keeping The contractor must ensure that a copy of the Environmental file is always kept on site, and the file must include the following: ▪ A copy of this MMP ▪ Records of the MMP audits conducted;	Project Manager/ ECO/ Contractor	Ongoing

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
environmental issues and authorisations to ensure compliance.	▪ Correspondence with I&APs; ▪ Material Safety Data Sheets (MSDS) ▪ Records of staff environmental awareness training; ▪ Public complaints register; ▪ Records of how each complaint was dealt with; ▪ Incident response register should be updated; ▪ Emergency spill response register; ▪ Waste disposal certificates; ▪ Any procedures required in terms of this MMP.		
	<u>Sub-Contractor Management</u> a) Main Contractor, Project Manager and ECO must ensure that a copy of this MMP is brought to the attention of all sub-contractors and their employees. b) Sub-contractors must comply with all the requirements of this document and adopted MMP. c) This MMP must form part of the project documentation of all contractors and subcontractors working on the project. d) Evidence of Environmental awareness training for all employees must be kept on site. Employees must be fully inducted on the activities' impact on the environment and mitigation thereof.	Project Manager/ ECO/ Contractor	Ongoing
Site Layout and Maintenance camp *Site Layout Plan must*	<u>Site Layout Plan</u> a) Contractor or Engineer must ensure that principles of this MMP are taken into consideration in the designs of site layout plan.	Project Manager/ ECO/ Contractor	Prior to moving onto site

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
take Environmental Legislation and floodlines into consideration	b) The site layout plan must be submitted to the Project Manager and ECO for approval before implementation. c) The plan must reflect routing, haulage roads, maintenance camp with location plans, work areas, water and sanitation, eating areas, materials stores and stockpile areas.		
	<u>Construction/ Maintenance Camp</u> a) Construction/ Maintenance camp must be located above ecologically sensitive areas (watercourses). b) Construction/ Maintenance camp must be located outside of the 1:50 year flood line or 100m away from any watercourses, whichever is the greatest. c) Cut and fill must be avoided during the set-up of the Maintenance camp. d) The size of the maintenance camp must be minimised to avoid any vegetation clearing. e) The Contractor must ensure that ponding of possible stormwater from the camp site is avoided at all costs. f) Drinking of water from any watercourse is discouraged; potable water of approved drinking standards must be supplied to personnel onsite. g) Potable ablution facilities (at a ratio of 1:10) must be made available on site during the construction and must be emptied at a licensed Waste Treatment Works regularly. h) No uncontrolled fires are allowed on-site for any purpose.	Project Manager/ ECO/ Contractor	Site Establishment and during construction

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
Waste Disposal *Waste must be appropriately disposed of at a licenced waste disposal site.*	<u>Waste Disposal</u> a) Waste must be separated onsite to support the waste management hierarchy – "Reduce, reuse, recover and only dispose safely as the last option" b) No burning of waste onsite, and all waste must be disposed of at a licensed waste disposal facility c) No waste must be buried on site d) Refuse bins must be placed at strategic positions to prevent littering and visual impact. e) All recyclable waste generated on site must be separated into the main line recyclable, i.e., paper, plastic, glass, tins and tyres. f) Waste stockpiles stored in an open area must be covered with an impermeable cover. g) Weatherproof, durable and legible waste disposal signs in at least three (3) official languages applicable to the area must be displayed at each entrance to the facility.	Project Manager/ ECO/ Contractor	Site establishment and construction
Storage and Hazardous Substances *Storage areas: Hazardous substances may be detrimental to the*	<u>Storage Areas</u> a) Hazardous substances must be stored in a designated area, demarcated and fenced. b) Storage areas must be secure and safe from access by animals to minimise the risk that might be associated with the above. c) MSDS must be readily available on site for all chemicals and hazardous substances used on site.	Project Manager/ ECO/ Contractor	Site Establishment/During construction

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
environment if not stored appropriately.	d) Where possible, MSDSs should include information on the ecological impacts of each substance used in case of pollution incidents. e) Fuel tanks must adhere to relevant legislative requirements and be elevated so that leaks can be easily detected. f) Secondary containment structures must be placed under all fuel and hazardous materials to contain at least 110% volume of the fuel in case of major accidents or spillages. g) Clear signage must be installed in all tanks containing hazardous substances. h) Staff responsible for hazardous substances must be made aware of the potential impacts of this material on humans and the environment. i) All stationary construction machinery must have a drip tray and be used accordingly. j) A spill kit must always be on-site. k) The fuel stored on site must not exceed the combined capacity of 30m³. <u>Security</u> l) Necessary security measures must be implemented to ensure safe storage of hazardous substances. m) Potentially hazardous areas such as trenches must be clearly marked and demarcated.		

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
Materials Management Sourcing & Storage	Source of Materials and Storage a) All materials used during construction must be sourced in accordance with relevant legislation. b) Backfill materials must be done with excavated in-situ materials as far as possible. c) Material stockpiles or stacks must be avoided or stabilised where they cannot be avoided. d) No materials or stockpiles must be stored within the flood line or 100 metres from a watercourse.	Project Manager/ ECO/ Contractor	Ongoing
Education of the Site Staff on General and Environmental Conduct *These points need to be made clear to all staff on site before the project begins.*	Environmental Education and Awareness a) Contractor must ensure a basic level of environmental awareness and training is conducted prior to the commencement of the project. The training topics should cover the following: • What is meant by "environment"; • Why the environment needs to be protected and conserved; • How Maintenance activities can impact the environment; • What can be done to mitigate impacts associated with maintenance? • Awareness of emergency and spills response provisions • Waste management on-site • Social responsibility during Maintenance. E.g. being considerate to residents. b) Where necessary, translation of training must be made.	Project Manager/ ECO/ Contractor	During staff induction and ongoing.

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
	c) The training and awareness may include health and safety aspects. <u>Worker's Conduct on Site</u> a) Staff personnel must adhere to the principles of this Maintenance Management Plan. b) No poaching, hunting of animals, or harvesting of firewood from the site or from the land adjacent to it. c) No swimming or fishing in any water course on site. d) No collection of medicinal plants or any other objects will be allowed.		
Dust / Air Pollution *Excessive speed on an untarred road can reduce air quality*.	<u>Dust / Air Pollution Management</u> a) Vehicles must adhere to speed limits to avoid excessive dust. b) Dust suppression must be undertaken in all exposed areas.	Project Manager/ ECO/ Contractor	Throughout the duration of the project
Soil Erosion *The stripping of vegetation during preliminary activities on site greatly increases the risk of erosion.*	<u>Soil Erosion</u> a) Topsoil from the maintenance activities must be stockpiled and contained within a berm to prevent and minimise loss. b) Topsoil must be stockpiled in a designated area away from a possible source of contamination and must be used for vegetation/landscaping. c) Overburden material must be disposed of safely at a licensed facility, where it cannot be reused.	Project Manager/ ECO/ Contractor	Throughout the duration of the project

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
	d) Shaping of the remaining profile must blend in with the gradient of the surrounding landscape. e) Soil erosion must be controlled onsite during all phases of the development. f) All stockpiles must not cause a visual impact in the area.		
Sensitive Habitat *Sensitive habitats must be protected.*	<u>Sensitive Habitats</u> • Sensitive areas such as the watercourses must be demarcated, and the contractor must ensure that maintenance work does not encroach into demarcated sensitive areas, except activities that are outlined in this MMP. • The infestation of alien and invasive plant species must be controlled, and indigenous species must be used for rehabilitation during all phases of the development. • Clearing of indigenous vegetation must be limited to the development footprint during development/maintenance activities.	Project Manager/ ECO/ Contractor	During site establishment and ongoing.
Social Impacts – Visual & Noise *It is important to take note of the needs of those living or working adjacent to the site. Failure to do*	<u>Noise Pollution</u> • Maintenance must be limited to working between 07H00 and 17H00, and notice must be given to directly affected parties should the maintenance deviate from above working hours. • All reasonable steps must be taken to minimise visual pollution, noise and mechanical vibrations in the vicinity of the watercourses.	Project Manager/ ECO/ Contractor	During Maintenance

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
so can disrupt work and increase costs in the form of delays.	Complaints Management a) Complaints from affected parties must be attended to as soon as possible. b) The complaints register must be kept on site and produced on request.	Project Manager/ ECO/ Contractor	Ongoing
Heritage and Archaeological *Heritage and archaeology must be protected*	Heritage and archaeological assessment a) Should any object of archaeological importance be identified, work in such an area must be stopped, and the incident must immediately be reported to the nearest South African Heritage Resources Agency offices to comply with the National Heritage Act, 1999 (Act No. 25 of 1999)	ECO	During site set-up and ongoing.
Rehabilitation *Rehabilitate affected section of the stream and vegetation*	▪ Reshape and stabilise disturbed stream areas to resemble the natural stream profile and flow patterns. ▪ Remove all excess construction materials, rubble, and waste from the stream and surrounding areas. ▪ Dispose of waste at a licensed and authorised waste disposal facility. ▪ Stabilise exposed soils to prevent erosion and sedimentation. ▪ Re-vegetate disturbed areas using indigenous and locally occurring plant species. Install erosion and sediment control measures such as: a) Silt fences b) Erosion blankets	ECO	Post maintenance activities

Management Measures for all Phases			
Aspect	**Description**	**Monitored By**	**Monitoring Frequency**
	c) Gabions d) Stone pitching e) Biodegradable erosion-control materials ▪ Rehabilitate disturbed stream banks and riparian vegetation areas. ▪ Prevent stormwater discharge from causing scouring or erosion within the stream channel. ▪ Ensure stormwater outlets are designed to dissipate flow energy effectively. <u>Conduct regular monitoring of:</u> a) Vegetation establishment b) Bank stability c) Erosion levels d) Stream flow conditions ▪ Implement corrective actions where rehabilitation measures are ineffective. ▪ Remove and control invasive alien plant species in disturbed areas. ▪ Restrict unnecessary access to rehabilitated areas to allow vegetation recovery. ▪ Maintain rehabilitation measures until the area is stable and self-sustaining.		

15 RECOMMENDATIONS & CONCLUSIONS

All the mitigation measures that have been outlined in this MMP should be adhered to at all times, and contravention of this will result in penalties or cessation of work. The environmental and biophysical impacts of the project have been assessed throughout the project life cycle. Both positive and negative project-related impacts have been identified, and the negative impacts will not cause significant impacts if they are mitigated to acceptable levels. To further minimise the impacts associated with maintenance activities, a rehabilitation plan inclusive of an alien and invasive plant species management plan/s must be incorporated as part of this MMP.

APPENDIX A: METHOD STATEMENTS

PROJECT NAME: UPGRADING OF IRPTN LINE 3 OPERATIONS PRINCE'S PARK AND BUS STOPS BAY ALONG WF NKOMO STREET

PROJECT NUMBER: RTD 04-2023/24

Submission Date: 20/05/2025

Method Statement

Description of Works

Coordination of discharge Area for Stormwater line.

1. **Purpose**

   For ensuring that the installation of a stormwater line with a diameter of 525 mm from the planned joint manhole to the proposed discharge point is coordinated appropriately and does not compromise the environmental characteristics surrounding thee-in points during the construction process.

2. **Scope**

   This method statement covers construction of the stormwater line from the planned joint manhole to the proposed discharge point for the 525 mm diameter pipes. The stormwater line is approximately 57 meters in distance and the calculated discharge velocity = 0.47 m/s, at a flow rate of 0.89 m^3/s.

3. **Responsibilities**

   Site Agent: Oversee the entire process and ensure compliance with the statement of methods.

   Environmental Officer: To ensure environmental compliance during the execution of works

   Construction Supervisor: Supervise the on-ground team and coordinate the execution of construction of stormwater line

   Local labors: Lay and Bed the storm water pipes as instructed.

   Health and Safety Officer: Ensure all safety procedures are followed.

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4. Materials and Equipment

- Excavator
- TLB
- 525 mm Pipes (Approx 57 meters)
- G6 material (Bedding)
- Rammer compactors x 4
- Fishline
- Gauging rode
- Dumpy level set
- Line marker
- Hand tools

5. Procedure/Methodology

- Exposing of Existing Services – Hand excavation
- Demolishing of Existing structures i.e. Manholes, Stormwater pipes.
- Site Clearance – Removal of debris and clearing working area.
- Removal of vegetation – Removal and Preserving topsoil.
- Surveying: Levels Setting Out
- Excavation: Trench excavation
- Bedding – processing and preparation of bedding layer
- Compaction tests – Density tests
- Pipe laying – Horizontal and Vertical alignment
- Backfilling – Filling the cover layer for the 525 mm storm water pipe

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- Tests & Inspections - Conduct tests and inspections to verify that the constructed stormwater line pipe is constructed within the Tshwane Standards and Specifications.

6. Quality Control

- Conduct visual inspection for the excavated trench.
- Conduct visual inspection for the quality and spec of 525 mm pipes
- Conduct compaction tests for bedding layer
- Conduct pipe alignment tests: Horizontal and Vertical alignment
- Conduct compaction tests for backfilling layer

7. Health and Safety

- PPE: All personnel to wear appropriate PPE.
- Manual Handling: We will provide to our personnel on the correct manual handling techniques.
- Site Safety: All site safety protocols to be adhered to, including proper signage and barriers around the work area.

8. Environmental

- Topsoil conservation will be prioritized.
- Sediment traps and barriers to prevent soil erosion and runoff from entering the stream
- Avoid damaging existing vegetation beyond the work zone
- Implement dust suppression measures like regular water spraying on exposed soils.

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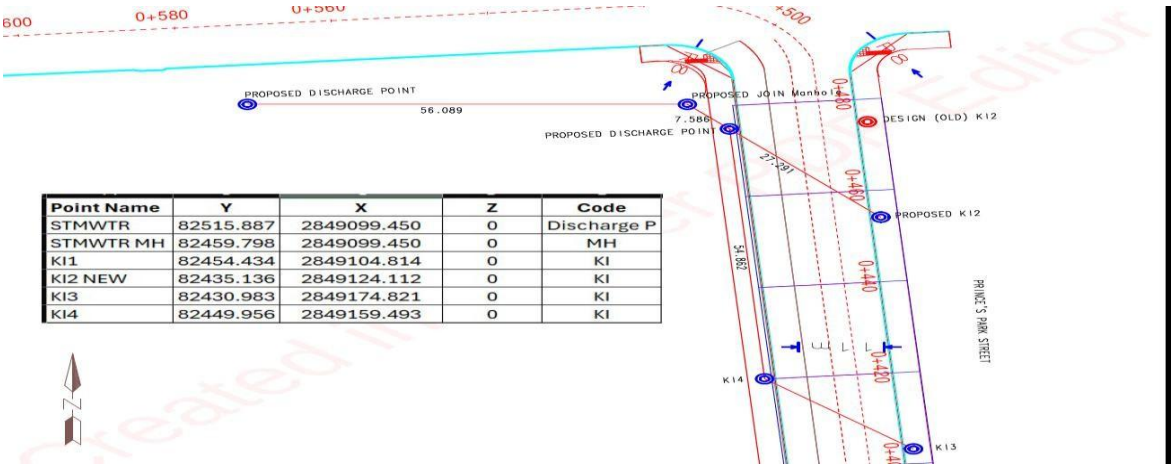
9. Documentation and Reporting

- Daily Site Diaries: Recordings detailing the quantity of work done and their locations.
- Inspection Reports: we'll complete and maintain inspection reports for quality assurance purposes.

10. Planning

- The area covered in the sketch below, indicates the position of the proposed stormwater line and its survey data.



Point Name	Y	X	Z	Code
STMWTR	82515.887	2849099.450	0	Discharge P
STMWTR MH	82459.798	2849099.450	0	MH
KI1	82454.434	2849104.814	0	KI
KI2 NEW	82435.136	2849124.112	0	KI
KI3	82430.983	2849174.821	0	KI
KI4	82449.956	2849159.493	0	KI

11. Conclusion

- To ensure the proposed 525 mm stormwater line construction proceeds without environmental setbacks, we are implementing a structured compliance framework aligned with all relevant environmental guidelines.
- Our approach prioritizes: Minimising ecological disruption during excavation and pipe laying. Monitoring sediment control and water quality throughout the project, ensuring all works adhere to site-specific environmental management plan.

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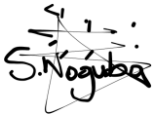
Document Approval

Name;		**Role**	**Date**	**Signature**
Compiled by: (Contractor) Puno Harvest Builders	Mr Sakhe Noguba	Site Agent	20/05/2025	
Reviewed by: (Contractor) Puno Harvest Builders	Mr Prince Makgopa	Project Manager	20/05/2025	
Reviewed by: (Contractor) Puno Harvest Builders	Mrs Busisiwe Mthimunye	Environmental Officer	20/05/2025	
Approved by: (Engineers) Imbawula Civil projects	Mr Tebogo Meselane	Resident Engineer		
Approved by: (ECO) Selahle Consultancy & Projects	Mrs Shonisani Selahle	Environmental Control Officer		

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SENSITIVITY OVERLAY LAYOUT MAP- SURROUNDING AREA

Map Prepared by:
Sibongile Hamisi

Contact No:
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SELAHLE CONSULTANCY & PROJECTS