

WATER USE LICENSE APPLICATION

Landscape Maintenance and Plant Plan

In support of NWA Section 21 (c) and (i) water uses related to the proposed upgrade of Leachville Ext 2 Sewer Pump Station and associated infrastructure, Erf 374, Leachville Township, Brakpan, City of Ekurhuleni, Gauteng Province

Project Applicant:



City of Ekurhuleni Metropolitan Municipality
Department of Water and Sanitation

Prepared by:



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1. DOCUMENT PURPOSE

The purpose of the report is to develop a Landscape Maintenance and Plant Plan to inform the Water Use License Application (WULA) that is required for the proposed upgrades to the Leachville Extension 2 Sewer Pump Station for which an environmental authorisation is sought in terms of the NEMA, 107 of 1998.

The Leachville Ext 2 Sewer Pump Station is an existing pump station due for upgrade and is located within a seep wetland just south of Apex Pan near Brakpan in Gauteng Province. The wetland is located within quaternary catchment C21D of the Upper Vaal Water Management Area in the Blesbokspruit sub catchment but is not part of a major drainage network.

The seep wetland is located amid an urban residential area and provides a high level of ‘Indirect Benefits’/ecological services i.e., flood attenuation, stream flow regulation, **sediment trapping**, water quality improvement and erosion control. The wetland plays a crucial role in trapping sediment to ensure less sedimentation of the main downstream river systems.

The ecological function and services of this wetland including its biodiversity must be protected and maintained by implementing a Landscape Maintenance and Plant Plan.

2. METHODOLOGY

The requirements of the Landscape Maintenance and Plant Plan and how the project responds to it are detailed in **Table 1**. The plan is specifically applied during site rehabilitation.

Table 1: Elements of the Landscape Maintenance and Plant Plan

No	Requirement	Description / Requirements Met
2.1	Site assessment	<p>The Biodiversity Company (TBC) conducted a site assessment on the 9th of June 2022, which constitutes a dry season survey to determine the current state of the wetland system. Refer to the Aquatic Impact Assessment included under Appendix G4 of the BAR.</p> <p>According to TBC the wetland’s present ecological state (PES) is rated as ‘Seriously Modified’ (Class E) owed to the following disturbances:</p> <ul style="list-style-type: none">• Alien invasive vegetation.• Construction of drainage channels.• Existing overflowing sewer pump station.• Dirt and tar roads.• Dumping of waste.

- Stormwater systems from adjacent residential areas contributing to high surface water inputs; and
- Grazing of animals.

Most of the project area has historically been modified to accommodate the development of the Leachville residential area, the existing pump station and as such remain in a transformed state.

Most of the project site comprise transformed habitat associated with the existing pump station, emergency ponds, road upgrade and has completely been transformed and no natural vegetation remains.

Various hydrophytic species do however exist in the great wetland system (including facultative species) i.e., *Imperata cylindrica*, *Phragmites australis*, *Scoenoplectus spp.* and *Typha capensis*.

The wetland is in a ‘Seriously Modified’ (Class E) present ecological state. The risk from the project to the wetland system is ‘Low’ because it’s a small-scale project entailing the upgrade of an existing facility.

The project will result in limited loss of wetland area and the hydrology has already been altered therefore there will be low function loss (< 1 ha).

2.2 Management Plan

The management plan was developed based on the specialist site assessment results. Section 5 outlines the strategies and actions needed to protect and maintain the seep wetland.

2.3 Erosion control

Erosion control measures are implemented to prevent soil erosion and protect the landscape from damage caused by water runoff.

A stormwater management plan has been compiled by Vumesa Consulting Engineers as part of the Detailed Design Report for the project.

The site is in a floodplain and has an urban catchment area of 6.5km². Majority of the stormwater from the catchment drains to the Apex Pan and Leeupan.

The pump station structures will have gutters which will collect clean rainwater from the roof and discharge to the apron which is proposed around the pump station structures. All the surface water (clean) is planned to drain naturally to the lowest point of the platform to the field/wetland. The emergency ponds (dirty water) will have adequate freeboard for storm events which will be pumped to pump station and to Vlakplaats /Waterval WWTW.

2.4 Water quality monitoring

Water quality monitoring will be conducted regularly to track changes in water quality over time.

The proposed frequencies, sample analytes and monitoring points are provided in the Monitoring and Auditing Plan attached as Annexure B to the EMPR.

The water quality monitoring will be implemented to observe/detect contamination risks to the wetland and impacts on the hydrological system promptly.

2.5 Alien invasive species management	<p>Invasive plant species are removed to prevent them from outcompeting native plant species and ensure that the landscape remains diverse and healthy.</p> <p>The project site predominantly comprises of the existing sewer pump station as well as alien and invasive species such as <i>Verbena bonariensis</i>, <i>Tagetes minuta</i>, <i>Cirsium vulgare</i>, <i>Erigeron bonariensis</i> and <i>Bidens Pilosa</i>.</p> <p>An Alien Invasive Plant Management Plan will be implemented to remove alien vegetation from the pump station, associated infrastructure including construction disturbed areas.</p>
2.6 Education program	<p>In line with Section 9 of the EMPR, the appointment Contractor and Environmental Control Officer (ECO) must provide environmental awareness training to the Contractor and the construction staff. It must be an on-site briefing and demonstration and will amongst others, focus on sensitive features i.e., Wetlands.</p>

3. OBJECTIVES

The upgrading of the Leachville pump station is a positive endeavour as it will cease the overflowing of raw sewage into the wetland system and downstream Apex Pan. Water quality monitoring did detect sewage in the stormwater channels in the seep wetland towards Apex Pan but the water in Apex Pan was clear¹.

Because the seep wetland is already seriously modified, the upgrades are proposed to an existing facility and there is no natural vegetation remaining at the pump station site the objective of the plan will include the following:

- Establish water quality monitoring to detect any sewage leaks or spillages from the facility throughout construction and operation of the facility.
- Rehabilitate the construction degraded areas; and
- Remove and control alien invasive species that have established during the construction phase; and
- Re-establish indigenous vegetation cover along the construction degraded areas i.e., indigenous grass seed mix.
- Control erosion through stormwater management and ensure that vegetation re-establishes on construction disturbed areas.

4. REHABILITATION ACTIONS

Landscape and rehabilitation in this document refer to the reinstatement of the temporarily construction disturbed areas, or due to construction related activities, to a state that resemble the conditions prior to the disturbances.

The project will have minimal impact on the wetland because the footprint area will mainly be limited to the existing pump station and immediate surroundings.

The management actions presented in **Table 2** overleaf must be implemented.

¹ Geohydrological Assessment Report, Isiqalo Esihle Earth Science Consultants, July 2023.

Table 2: Management and Rehabilitation Actions

<i>No</i>	<i>Aspect</i>	<i>Issue</i>	<i>Mitigation Action</i>	<i>Standard achieved</i>	<i>Responsibility</i>	<i>Frequency</i>
4.1	Soil	Soil compaction from construction activities. Loss of soil due to bare areas.	<ul style="list-style-type: none"> • Rip construction disturbed areas. • Plant indigenous seed/grass mix along the ripped / disturbed areas. • Ensure that vegetation has re-established. • Keep grazers off rehabilitated areas. 	Re-established vegetation cover along construction disturbed areas. No evidence of erosion.	Contractor (to satisfaction of Site Engineer)	Site clean-up and rehabilitation post construction.
4.2	Biodiversity	Further spread of alien invasive species into the wetland system.	<ul style="list-style-type: none"> • Remove any alien vegetation resultant from the construction activities and maintain the site free of alien invasive species. i.e., <ul style="list-style-type: none"> ○ Manual control: Hand-pulling / digging; or ○ Mechanical control: Physical destruction/total removal; or ○ Refrain from using chemical control due to fauna. 	Indigenous grass cover along former construction disturbed areas.	Contractor (Post construction during site clean-up it's upon the Contractor) EMM responsible for its control during the operational phase.	Site clean up and rehabilitation post construction. Operation (on-going)
4.3	Erosion	Erosion arising from construction disturbed areas (bare soils). Erosion evident along the pump station infrastructure towards wetland due to poor stormwater management.	<ul style="list-style-type: none"> • During construction: <ul style="list-style-type: none"> ✓ Implement effective erosion and sediment control measures. i.e., sediment barriers, silt fences, and sediment basins to prevent sediment from reaching nearby water bodies and infiltrating into the groundwater. ✓ Control construction site runoff. i.e., sediment ponds, retention basins, or vegetated swales to capture and treat runoff before it is discharged into the surrounding environment. • The Contractor must ensure that all temporary structures, equipment and materials and facilities created onsite for construction are removed on completion of the project. All disturbed areas must be rehabilitated. 	Re-established grass along the access road, temporary route and former construction works areas. No erosion. Waste manifest/safe disposal documents for waste. No water quality impairments detected during water quality monitoring due to	Contractor Site Engineer/EMM	After construction (site clean-up and rehabilitation). Operational phase

			<ul style="list-style-type: none"> • Stabilization and rehabilitation of the disturbed areas must take place immediately after construction. Indigenous vegetation must be used for these purposes (grassing). • Once the access roads have been constructed/upgraded, the material along the temporary route must be loosened and grassed. • The construction site must be cleared and cleaned to the satisfaction of the EMM, Site Engineer, and ECO. • The stormwater management plan for the pump station must separate clean and dirty water. Clean water can discharge to the wetland system. Dirty water to discharge to the emergency ponds. 	contaminated stormwater / sewage leaks.		
4.4	Ground and Surface Water	Stormwater events/high sewage volumes can overwhelm the pump station capacity leading to overflows. These overflows can discharge sewage into nearby wetland, Apex Pan causing water pollution.	<ul style="list-style-type: none"> • Conducting water quality monitoring during construction and operation to detect any sewage leaks, spillages. • Establish a surface and groundwater monitoring program during construction to detect any changes in groundwater levels or quality. Refer to Table 9 (item 11.3.3 – Table 11.3.3 Surface and Groundwater monitoring frequencies, sampled analytes, and Figure 5-4 for monitoring points in the EMPR including EMPR Annexure B Monitoring Plan). • Develop and implement a spill response plan to address accidental spills/releases of contaminants. 	<p>Representative and comprehensive monitoring to detect potential impacts on water quality.</p> <p>Regular measurement of groundwater levels will provide insight into the influence on local water table.</p> <p>Water quality monitoring will identify any contamination risks and impacts on hydrological system promptly.</p>	Site Engineer	Construction and Operation Phase.

4.5	Loss of wetland and function	Increased alteration of wetland	<ul style="list-style-type: none"> Demarcate the extent of the areas to be upgraded during the construction phase using a fence/metal posts and danger tape, only the demarcated areas should be impacted upon. 	<p>Site demarcated and fenced as per the approved site layout plan.</p> <p>Impacts limited to already disturbed areas.</p>	Contractor	Site demarcation Throughout construction phase.
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SIGN OFF BY ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Landscape and Plant Plan has been compiled by Naledzi Environmental Consultants Pty Ltd.

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