

10 October 2025

Brisbane City Council  
Development Services



Our Ref: CW23028

**76-84 King Avenue, Willawong QLD 4110**  
**Stormwater Technical Assessment**  
**(Applications: A006775803)**

## 1. Introduction

This technical assessment has been prepared to address Council's information request item No. 7 Stormwater Quality dated 22<sup>nd</sup> August 2025. It is noted that an Engineering Services Report prepared by Inertia outlining the stormwater quality requirements during the DA phase has been taken into consideration for the below assessment.

In addition, whilst it is acknowledged that council is noting the assessment to reflect the proposed staging plan of the development. It is proposed that the stormwater quality devices are to be implemented during stage 1 of the development, where the proposed SQID's are able to cater for the ultimate design of the development. As such, the below assessment will be for the ultimate design of the site.

## 2. Stormwater Quantity

### 2.1. Classification

The following key points are used to determine the classification of the site and the required compliance measures for implementing stormwater quality management for the development. Depending on the scale and nature of the project, one of the points below will be identified as the required criteria for design and implementation of stormwater quality management:

- Identify if compliance with the Dept. of Environment and Resource Management (DERM) State Planning Policy (SPP) is required for the development; or
- Identify if compliance with local authority stormwater objectives is required.

In any of the above cases, water quality management will be undertaken in accordance with the following important principles:

- Water Sensitive Urban Design (WSUD) principles shall be adopted where possible;
- Water quality controls shall be considered for both the construction phase and operational phase; and,
- Assessment of the site shall be undertaken during construction and maintenance period of for the development.

## 2.2. State Planning Policy Requirements

In accordance with SPP Assessment Benchmarks – Water Quality, a review of the SPP compliance criteria is required in determining if compliance with stormwater management design objectives is required.

As per Seqwater Development Guidelines: Water Quality Management in Drinking Water Catchments Figure 1, the development site is not located within the Water Supply Buffer Area.

Also, if any of the compliance criteria outlined below in Table 1a (Construction Phase) and 1b (Post Construction Phase) are deemed applicable, then compliance with the SPP is expected, in accordance with SPP Appendix 2 Table A and B for the construction and post construction phase stormwater management design objectives. If all of the criteria are deemed not applicable, then a local authority assessment or best management practice solution is required.

**Table 1a – State Planning Policy Compliance Criteria – Construction Phase**

Criteria	Status
Operational Work for urban purposes that involves disturbing more than 2500m <sup>2</sup> of land.	Applicable

As demonstrated above in Table 1a, compliance with the SPP Appendix 2 Table A (Construction Phase) is required for the development.

**Table 1b – State Planning Policy Compliance Criteria – Post Construction Phase**

Criteria	Status
Material Change of Use for urban purposes that involves land greater than 2500m <sup>2</sup> that:	
Will result in an impervious area greater than 25 percent of the net developable area; or	Applicable
Will result in six (6) or more dwellings.	Not Applicable
Reconfiguration of a Lot for urban purposes that involves a land area greater than 2500m <sup>2</sup> , and will result in six (6) or more lots.	Not Applicable

As demonstrated above in Table 1b, compliance with the SPP Appendix 2 Table B (Post Construction Phase) is required for the development.

## 2.3. Pollutants of Concern

During the construction and/or post construction phase of a development, the pollutants listed in Table 2 below have been identified as being typically generated which can have adverse environmental impacts within the downstream catchment. Thus, it is proposed to implement site-based water sensitive urban design principles to capture and treat applicable pollutants.

**Table 2 – Typical Pollutants**

Pollutant	Source
Litter	Paper, packaging, food waste, cigarette butts, off-cuts
Sediment	Unprotected exposed soils, erosion, stockpiles
Hydrocarbons	Fuel and oil spills
Toxic Materials	Solvents, Cleaning Agents, Asphalt Primer, Cement Slurry
Ph Altering Substances	Wash Water, Acid Sulphates, Cement Slurry
Thermal Pollution	Increased impervious area, vehicles and machinery

**2.4. Construction Phase Water Quality Management Strategy**

During the construction phase, a primary concern is sediment escaping the site. To address this an erosion and sediment control (ESC) plan will be prepared prior to construction. This plan will be prepared in accordance with Local Authority guidelines and industry standards. The ESC plan will form part of the environmental management requirements implemented by the contractor during construction.

**2.5. Post Construction Phase Water Quality Management Strategy**

**2.5.1. Water Quality Objectives**

The design objectives for the reductions in mean annual load from unmitigated development are presented in Table 3 below in accordance with SPP Appendix 2 Table B for South East Queensland.

**Table 3 – Post Construction Phase Water Quality Objectives for South East Queensland**

Pollutant	Load Based Reduction Objective
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

### **2.5.2. Stormwater Quality Improvement Devices (SQIDs)**

A suitable Stormwater Quality Improvement Device (SQID) arrangement is proposed to intercept and capture the pollutants and ensure that the potential impacts on waterways downstream are mitigated.

The stormwater runoff from the development is to be captured via pit and pipe network and conveyed to the proposed treatment system prior to discharging to the existing creek located downstream of the site along King Avenue. The runoff from the existing heavily vegetated areas as well as areas for land resumption will not be considered for the analysis as the areas are proposed to be undeveloped and deemed as unreasonable to be expected to over treat the site runoff to accommodate for the loss of land respectively as per outlined in the report prepared by Inertia. As such, these catchment has been excluded from the MUSIC model.

This SQID will be owned and maintained by the property owner.

## **2.6. MUSIC Modelling**

Stormwater quality modelling of the proposed development has been undertaken using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Version 6.3.0, developed by the Cooperative Research Centre for Catchment Hydrology (CRCCH). MUSIC enables the user to conceptualise the transfer of pollutants through a stormwater drainage system and provides an aid in quantifying the effectiveness of the proposed stormwater quality management strategy. MUSIC only provides quantitative modelling for Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN) and Gross Pollutants (GP).

The MUSIC model was setup in accordance with Water by Design MUSIC Modelling Guidelines (2018). The subsequent sections discuss the model configurations adopted for the analysis.

### **2.6.1. Meteorological Data**

The meteorological data required for MUSIC Modelling was sourced from eWater website. The following pluviographic data was used.

- Rainfall Period: 1/01/1980 to 31/12/1989
- Rainfall Station: 40214 Brisbane Regional Office
- Modelling Time step: 6 minutes

The 10 year rainfall period is in accordance with Table 3.1 from Music Modelling Guidelines (2018). The mean annual rainfall for this period based on the six minute time step is 1,178mm.

### **2.6.2. Source Nodes**

The split catchment approach in accordance with the MUSIC Modelling Guideline (2018) was used in MUSIC. The three surface types modelled are road, roof, and ground. Table 4 below outlines the MUSIC catchment areas modelled.

The rainfall runoff parameters for all nodes have been configured in accordance with Table 3.7 of the MUSIC Modelling Guidelines (2018) for industrial land use type.

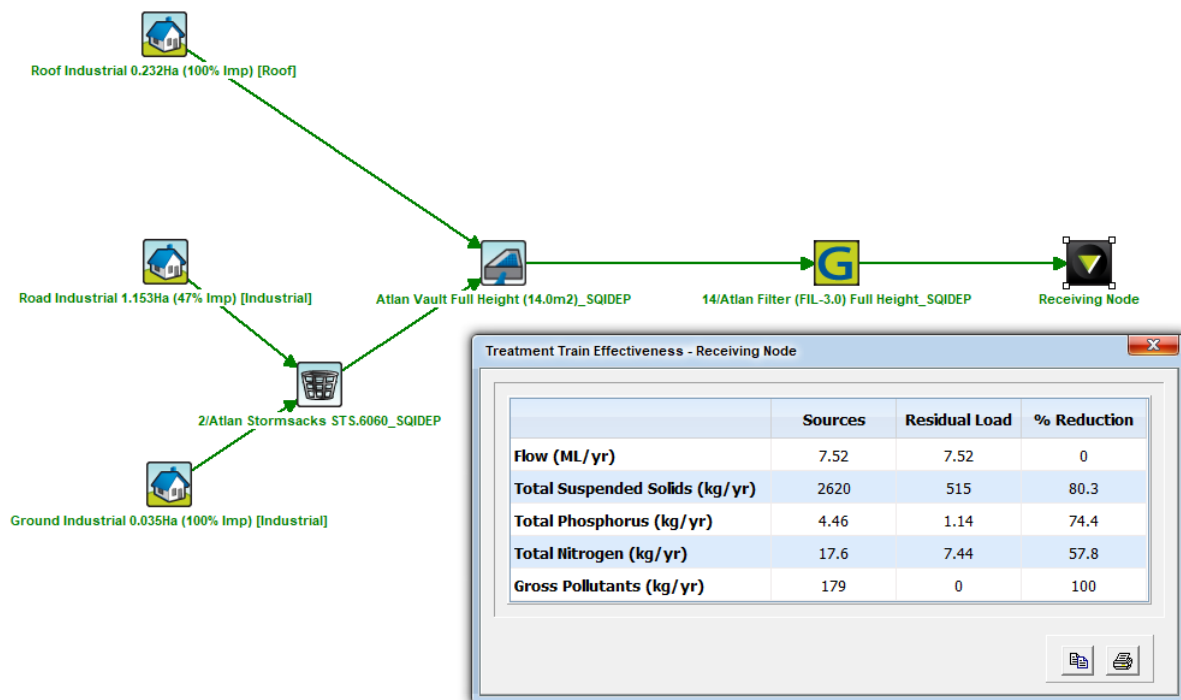
Pollutant export properties for source nodes have been configured in accordance with Table 3.8 of the MUSIC Modelling Guidelines (2018) for industrial land use type.

Stochastic generation estimation and serial autocorrelation set to zero has also been adopted.

**Table 4 – MUSIC Source Nodes**

Catchment	Surface Type	Area (m <sup>2</sup> )	Fraction Impervious
A	Roof	2315	100%
	Road	11525	47%
	Ground	352	100%

Figure 1 below illustrates the MUSIC model layout and results for the development site.



**Figure 1 – MUSIC Layout and Results**

### 2.6.3. Drainage Links

The default drainage links have been used. The default drainage link configuration assumes no routing. Section 4.17 of the MUSIC Modelling Guidelines (2018) states that this assumes flows and associated pollutants from all parts of the catchment arrive at the treatment nodes at the same time. This is conservative as it means that MUSIC may overestimate the overflow volumes.

### 2.6.4. Treatment Nodes

The following treatment node has been modelled in MUSIC.

#### 2 X Atlan Stormsacks

Atlan Stormsacks by Atlan were modelled using a Generic Treatment Node.

#### 14 X Atlan Filter cartridges

Atlan Filter cartridges by Atlan were modelled using a Generic Treatment Node.

The treatment nodes was provided by ATLAN and included the configuration of pollutant removal efficiencies.

### 2.7. MUSIC Results

MUSIC modelling results for the proposed stormwater quality management strategy are presented in Table 5 below.

**Table 5 – MUSIC Results**

Pollutant	Reduction Achieved	WQO	WQO Met?
Total Suspended Solids (TSS)	80.3%	80%	Yes
Total Phosphorous (TP)	74.4%	60%	Yes
Total Nitrogen (TN)	57.8%	45%	Yes
Gross Pollutants (GP)	100.0%	90%	Yes

The above results indicate that the water quality objectives are met when considering the contributing catchments for the site. It can therefore be concluded that the proposed treatment train satisfactorily addresses both Brisbane City Council (BBC) and State Planning Policy water quality requirements.

### 3. Conclusion

Based on the above assessment, it can be concluded the new proposed treatment train is able to meet Council's information request item No.7.

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