AURA SOUTH EARLY RELEASE AREA

STORMWATER QUALITY MANAGEMENT PLAN

VERSION 1

DesignFlow

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SUMMARY

This document describes the stormwater quality management strategy proposed for Aura South Early Release Area development. The strategy responds to the protection requirements of the downstream waterways including a Threatened Ecological Community (TEC) wetland, Halls Creek and Pumicestone Passage. The strategy has been designed to achieve stormwater management objectives which have been informed by the approval given to Aura South under Environment Protection and Biodiversity Conservation (EPBC) Act (EPBC approval 2023/09548) and associated technical work completed by Stockland and Water Technology.

This stormwater quality management strategy covers 86ha of Aura South development known as the Early Release Area. The development includes the creation of residential dwellings, small commercial area, sports fields and recreational park land uses. An additional 3.9ha of the Bells Creek Arterial is also considered in the stormwater strategy and modelling.

The site drains in south east via sheet flows and farm drains via two drainage pathways through future stages of Aura South into a Threatened Ecological Community (TEC) wetland located to the east of the site. All runoff from the site flows into a State Government declared High Ecological Value area (Pumicestone Passage) via a TEC wetland within the site and Halls Creek. Consequently, requirements for comprehensive stormwater quality improvement from the site are imperative.

This strategy proposes a comprehensive combination of treatment systems responding to the very high value receiving waters. Treatment will occur via precinct scale bioretention systems (primary treatment method) along with sediment basins and swale/vegetated channels integrated into linear corridors and open spaces. The treatment systems have been located within the constraints of site levels, available space and environmental habitats. In addition, rainwater tanks are used on most allotments for water reuse in toilets and outdoor demands.

For flooding and waterway stability modelling and reporting for the site, please refer to *Aura South Early Release Area Flood Study* (Water Technology, November 2026).

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1 Introduction

The Aura South development site has been the focus of extensive water quality and stormwater management investigations over the last 2 years. This work has established the water quality characteristics of the receiving waterways (i.e. Threatened Ecological Community (TEC) wetland and Pumicestone Passage), monitored the quality of water in the receiving waterways, completed extensive catchment and receiving waterbody modelling, established stormwater objectives and conceptually defined stormwater treatment strategies to meet these objectives. These requirements are now included in a Federal Government approval for the site under the EPBC Act (approved 22nd May 2026 EPBC ref 2023/09548).

This report focusses on Aura South ERA (referred to herein as "the site") as illustrated in Figure 1. This includes 86ha of residential dwellings, small commercial area, sports fields and recreational park land uses as illustrated in Figure 2.

This report presents a SQMP for Aura South Early Release Area reflecting recent investigations and consideration of site constraints and proposed development land uses and levels. The strategy ensures the stormwater objectives for Aura South are achieved using stormwater management measures that respond to the site constraints while providing flexibility through future detailed design.

The treatment strategy for Aura South ERA is consistent with the stormwater management objectives established for Aura South through investigations undertaken to support the EPBC approval (EPBC Ref: 2023/09548). These objectives have been adopted for the urban development in the catchment to ensure no adverse impacts to the TEC wetland, Halls Creek and Pumicestone Passage when combined with the regional stormwater management initiatives proposed for the site. The stormwater treatment strategy for Aura South ERA has been developed to achieve these objectives established for the urban catchments.

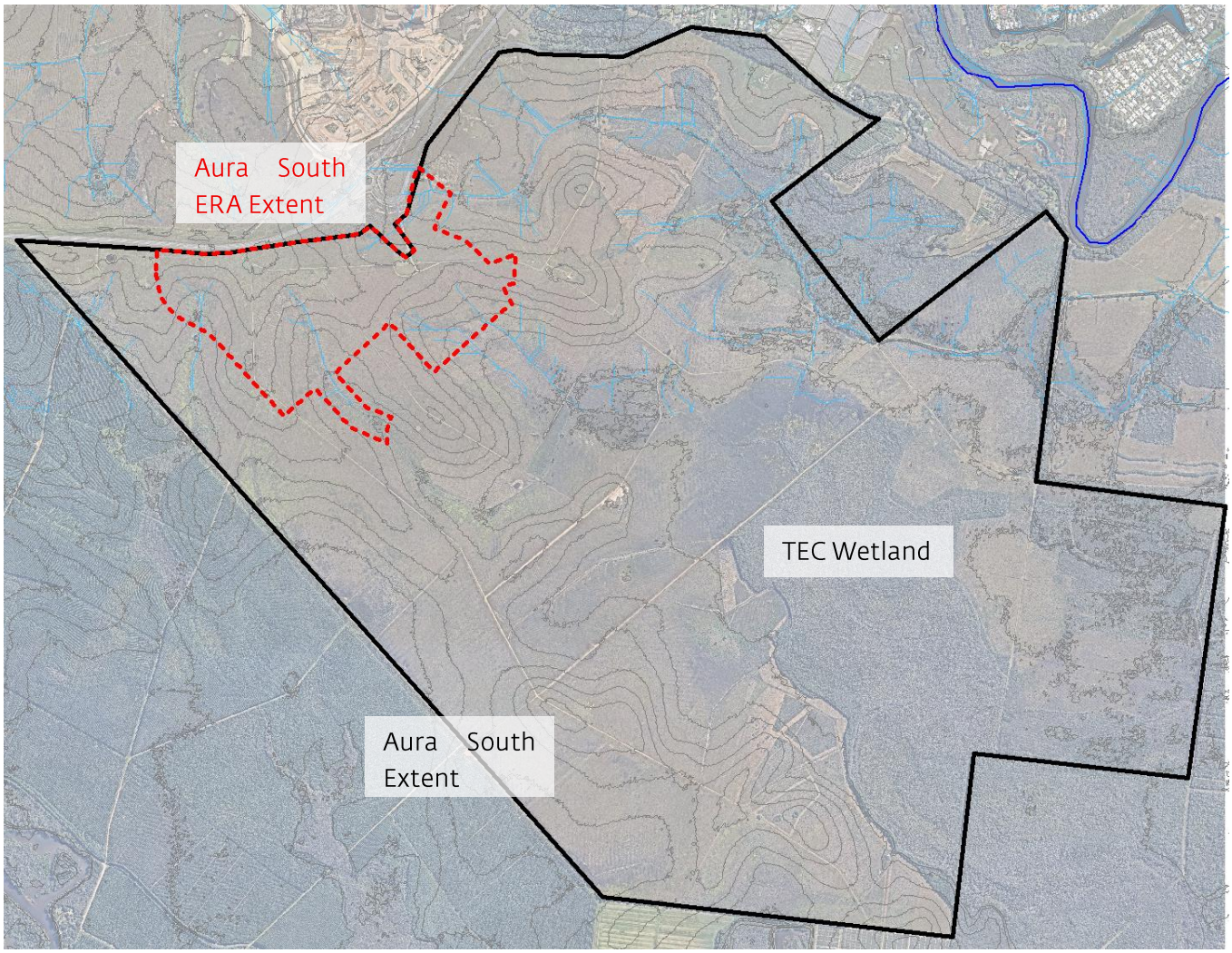


Figure 1 Aura South Early Release Area Site Location



Figure 2 Aura South Early Release Area Layout (Place Design)

2 Site Characteristics

The description of the site presented in this section relates to elements that affect the stormwater management strategy for Aura South ERA. More thorough site descriptions of soils, geology, climate, vegetation and habitats are not replicated as these are covered in other reports relating to the site.

2.1 Landuse, topography and drainage

The site is located on cleared grazing land that is relatively flat to moderate slopes with average grade of 1-2% grade even though the elevations on the site range between RL 5–23 m AHD.

The area is bordered by the Bells Creek Arterial to the north and future Aura South development precincts to the south and east (Figure 3).

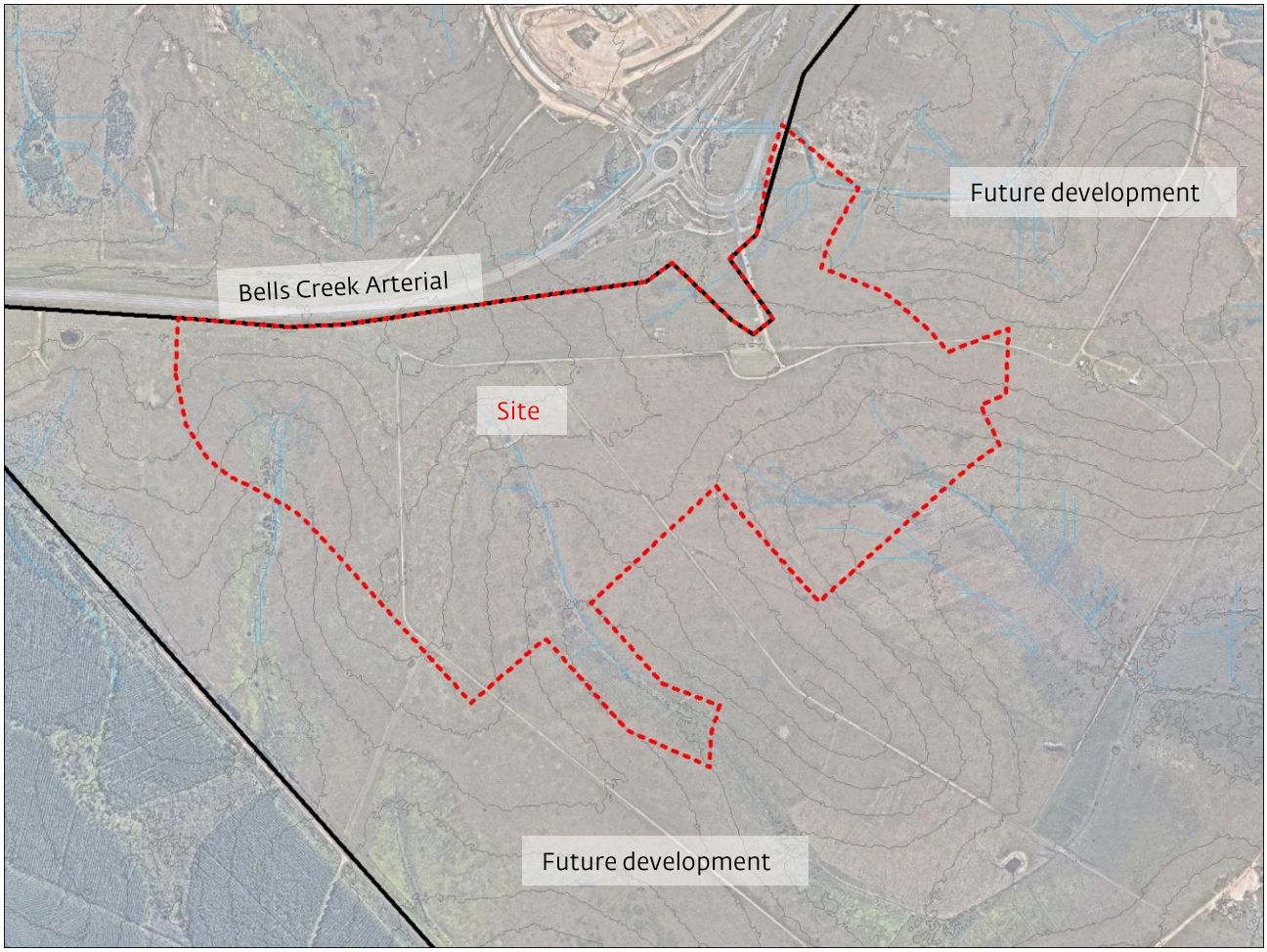


Figure 3 Existing land use, topography and drainage

The site drains in a south easterly direction via sheet flow and a cut farm drains towards the TEC wetland in the east. There are no external catchments other than some minor catchments from the Bells Creek Arterial.

Planned earthworks as part of Aura will include reshaping the site to create some defined drainage and open space corridors where stormwater will be captured in precinct scale WSUD systems.

2.2 Wetland / frog habitat and buffers

As part of the EPBC approval (2023/09548), wetland and frog habitat areas were mapped along with associated buffers and offset areas. This mapping is illustrated in Figure 4. The approval provides firm guidance on how stormwater infrastructure is to interact with wetland and frog habitat and buffer.

The Aura South ERA site is well outside this mapping, so consideration of how this infrastructure interacts with the habitats and buffer is not critical. Future development of Aura South will carefully consider the interaction with the habitats and buffers, the details of which will be provided with future applications.

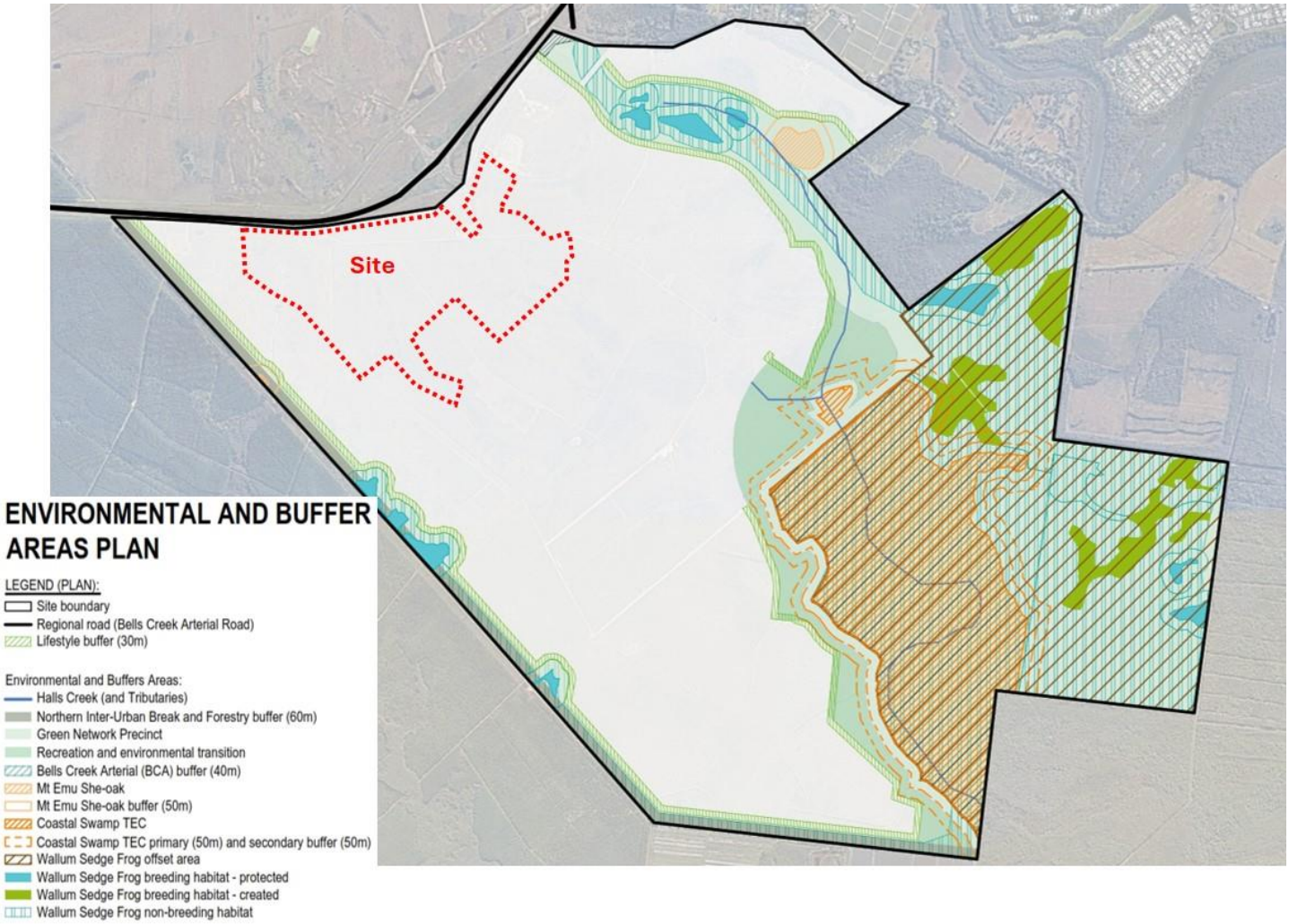


Figure 4 Existing land use, topography and drainage

2.3 Geology and Soils

Soils across the broader Aura South site are characterised by a mix of alluvial sands, clayey alluvial deposits and clay-rich lateritic soils derived from weathered Landsborough Sandstone. The low-lying central portions of the site contain thicker alluvial sand deposits associated with the wetland system, whereas elevated areas (i.e. Aura South ERA) commonly have little or no alluvium and either clays or sandstone is encountered near the surface. Groundwater monitoring and bore logging indicate variable infiltration characteristics, with the alluvial soils providing relatively higher permeability and groundwater storage, while the lateritic clay-rich horizons restrict vertical groundwater movement and contribute to seasonal wetland inundation and perched groundwater conditions.

Infiltration testing was completed at seven locations in the ERA and reported in Site investigation report (Wagner September 2026). The investigation found in-situ saturated hydraulic conductivity ranged from 2.9mm/hr to 13.3mm/hr with an 6.85mm/hr.

3 Stormwater Objectives

3.1 Stormwater quality and flow volume

There are several fundamental drivers for managing stormwater from Aura South. The adjacent sections of Pumicestone Passage which receive runoff from the site have been defined as having High Ecological Value (HEV) status in the *Environmental Protection Policy (EPP) – Water* (2019). Water quality objectives that accompany HEV status are specifically quantified as maintaining existing water quality (20th, 50th and 80th percentiles) in the receiving waterway (Department of Environment and Heritage Protection).

Pumicestone Passage and the TEC Wetland within Aura South have also been defined as having Ramsar wetland status. With such significant high value environmental areas downstream of Aura South, considerable investigation and planning has gone into protecting these areas from the impacts of urbanisation as part of the Aura South EPBC approval (2023/09548).

Stormwater load based objectives to be applied to Aura South ERA were established as part of the EPBC approval (2023/09548) and are presented in Table 1. These exceed *State Planning Policy* requirements, reflecting the significance of the receiving waters and ensure the requirements of the *Environmental Protection Policy (EPP) – Water* (2019) and Section 440ZG of the *Environmental Protection Act* (1994) are achieved.

Table 1: Stormwater quality and flow design objectives

Pollutant	Minimum reduction in mean annual load from unmitigated development
Flow	23%*
Total Suspended Solids	90%
Total Phosphorus	85%
Total Nitrogen	65%
Gross Pollutants	90%

* Subject to the local infiltration capacity of the soils within Aura South ERA.

3.2 Flooding and waterway stability

Please refer to the relevant *Aura South ERA Flood Assessment* (Water Technology, 2026) for flooding and waterway stability objectives and investigations.

4 Stormwater Quality Management Strategy

This section provides an overview of the stormwater strategy and describes the treatment systems proposed for Aura South Early Release Area.

4.1 Design principles

To develop a robust stormwater treatment strategy, a number of principles were applied for managing stormwater quality. These include:

1. Flexibility – The stormwater treatment strategy will have flexibility and redundancy to allow adjustment in response to site constraints and issues identified as part of future design. This allows the design to be modified during detailed design if an unforeseen constraint is identified.
2. Avoid double treating – As much as practically possible, stormwater that has been "treated" in a wetland or bioretention system should not flow into a downstream treatment but rather be discharged to the receiving channel or waterway.
3. Identify precinct scale treatment opportunities – Explore all precinct treatment systems within open space zones, along drainage corridors and along the edge of the development (for future states). Treatment systems need to work within the constraints of the development and drainage for locations within the development. This approach ensures the right balance of treatment systems at a precinct scale within the catchment while avoiding large numbers of small systems needing maintenance.
4. Match catchments, levels and drainage to end-of line treatments– Consideration of slopes, drainage and earthworks requirements to ensure the correct catchment areas were drained to spaces that allowed suitably sited treatment system and also drainage can occur to these systems to allow proper drainage into the creek or waterway following treatment.

4.2 Stormwater treatment strategy

A concept layout for the stormwater treatment strategy for the site is presented in Figure 5. It shows how stormwater is directed through tanks, GPTs, sediment basins, bioretention and swales before entering the downstream receiving waterways (i.e. TEC wetland, Halls Creek and Pumicestone Passage).

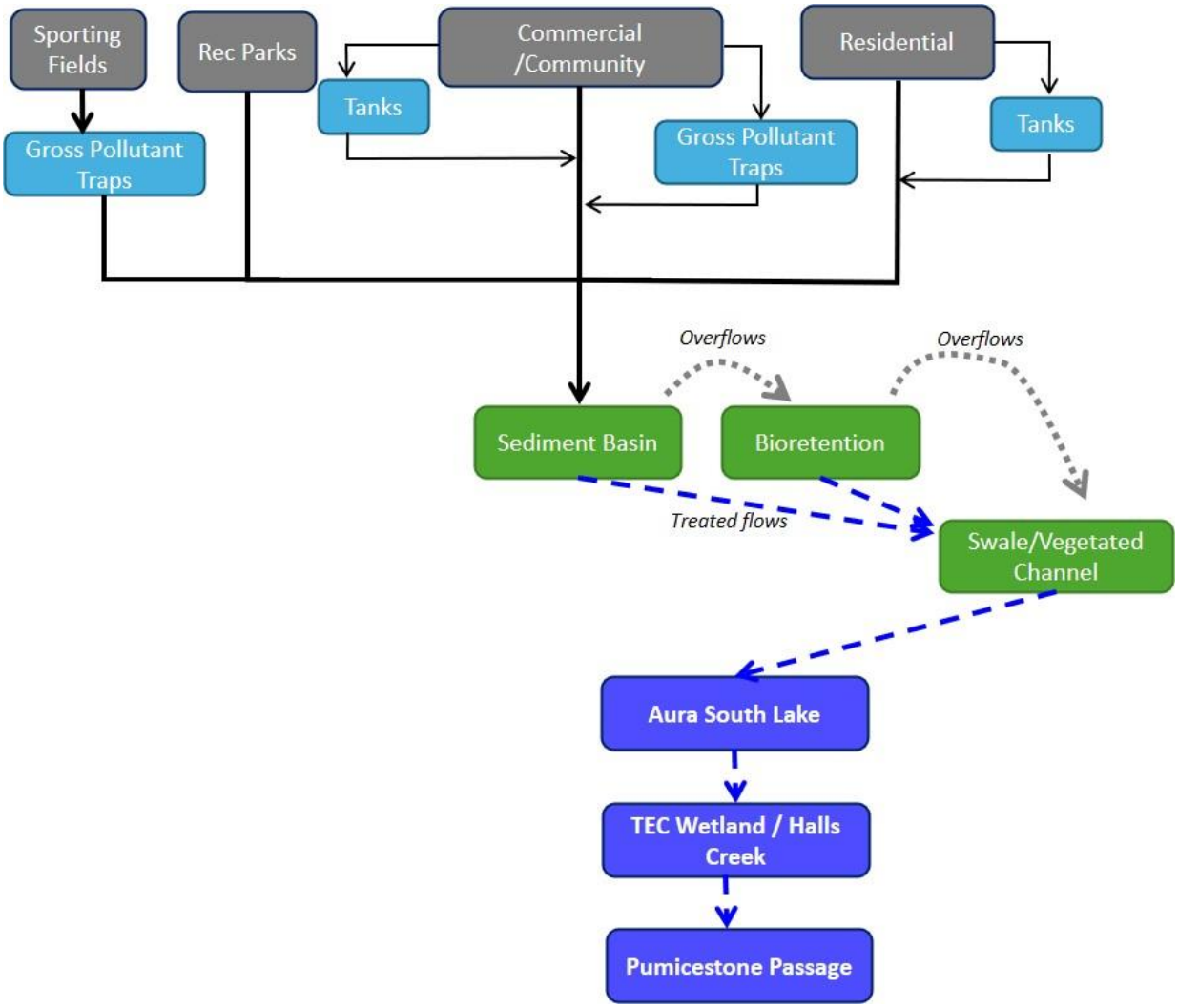


Figure 5 Stormwater treatment train flow diagram

The strategy for Aura South ERA adopts a similar approach to that taken in the Aura development. The same suite of stormwater treatment measures are used (i.e. rainwater tanks, gross pollutant traps, bioretention and wetland systems and vegetated swales in various forms). For Aura South ERA treatment measures have been applied responding to proposed land uses and the constraints of the site while providing flexibility to achieve the stormwater management objectives.

The stormwater treatment strategy includes:

1. **Tanks** are included in the strategy and will provide a water conservation function. The tanks are to be placed on retirement living, residential, commercial, community and school lots and plumbed for toilets and outdoor uses. Refer to Section 5.1 for details.
2. **Gross pollutant traps** on lots for landuses which generate high volumes of litter (i.e. commercial, industrial, school, community facilities, child car and sporting ovals)
3. **Precinct scale treatment systems** (i.e. combined sediment basins and bioretention systems of just bioretention systems) have been sized to achieve the stormwater quality objectives in combination with upstream treatments. Based on concept layouts there is suitable space within the proposed layout.
4. **A vegetated waterway** within Aura South ERA will collect and convey flows from some of the treatment systems and convey water to towards the TEC wetland. The waterway will provide additional treatment of moderate to high flows.

Figure 6 presents the proposed catchment areas and overall treatment strategy, including the location and sizes of the treatment systems. Table 2 presents catchment and treatment size details for the proposed end of line treatment systems.

Note the sizes nominated in Table 2 for treatment areas are the wet areas of sediment basins, and the filter surface area of bioretention systems. They do not include land for required batters, access tracks etc. Total land requirements have been considered carefully when developing the concept layouts and development layout for Aura South ERA and are presented in Appendix A. Refinement of the designs will occur through detailed as the catchments and earthworks of the development are developed.

Table 2 Stormwater catchments and treatment system areas for Aura South ERA

Catchment ID	Area	Inlet Pond		Bioretention
	(ha)	Volume (m3)	Area (m2)	(m2)
A	25.29	750	500	7215
B	3.56			
C	4.21			1052
D	4.68			1170
E	2.95			735
F	2.7			675
G	16.6	750	500	7210
H	10.05			
I	2.22			
J	6.82			1705
K	4.9			1225
L	4.02			1005

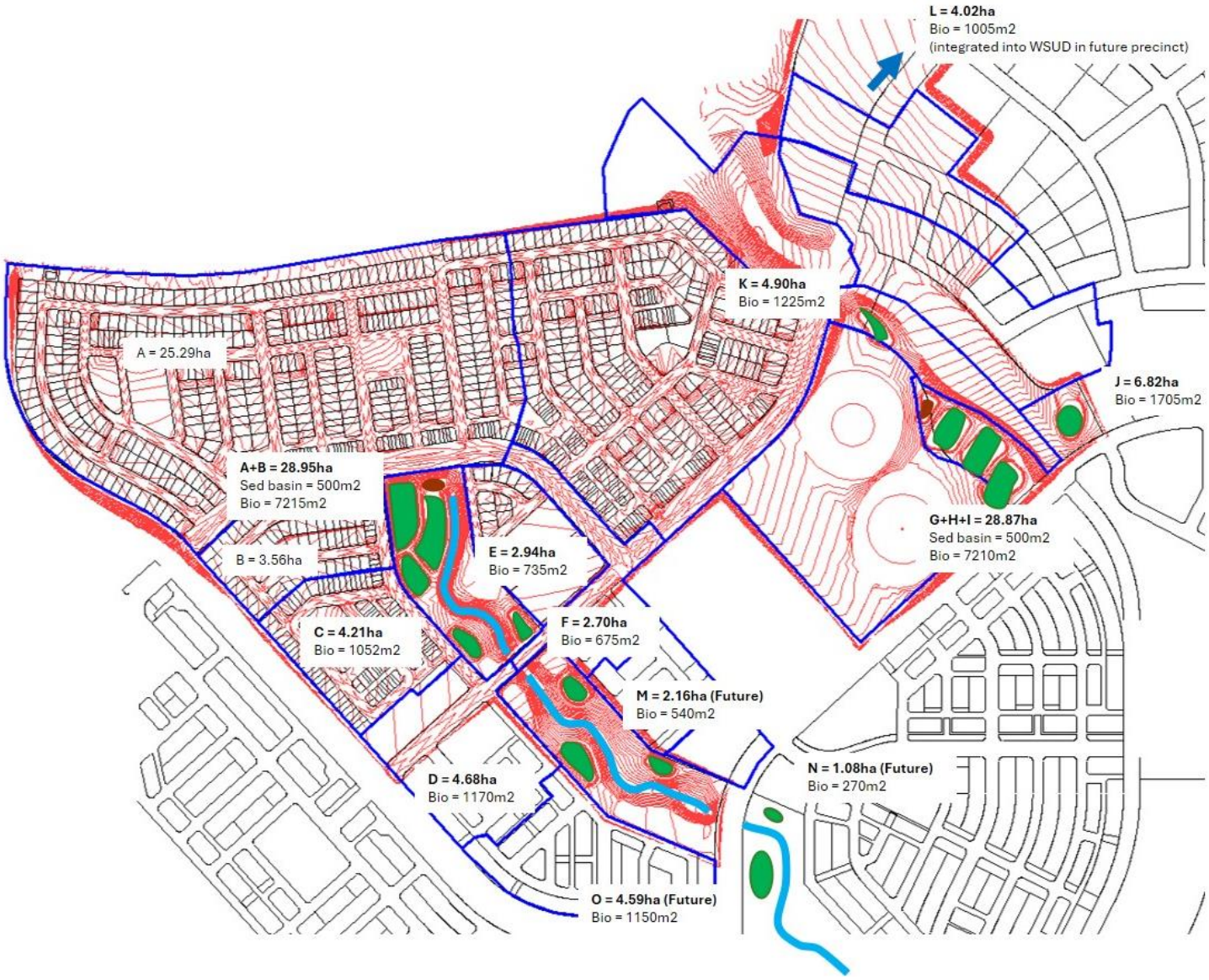


Figure 6 Stormwater treatment strategy for Aura South Early Release Area Site

4.3 Stormwater treatment measures

The table below briefly describes the stormwater treatments measures adopted for Aura South ERA. Many have been applied to other precincts of the Aura development.

Table 3 Summary of Stormwater Treatment Measures for Precincts

Measure	Description
Rainwater Tanks	As part of Stockland's water conservation policy and to reduce the volumes of stormwater runoff, rainwater tanks are proposed for residential, commercial, industrial, community and school land uses. Water from the tanks is to be plumbed for toilet, cold laundry tap, outdoor uses and suitable non-potable demands. While the tanks serve an important water conservation role they also act to reduce the volume of stormwater (and associated pollutants) from reaching downstream waterways. Section 5.1 outlines the proposed tank implementation for Aura South ERA.
Gross Pollutant Traps	Commercial, industrial, school, child care, community and sporting parks are a significant source of litter and sometimes sediment at ground level. Runoff from the ground level area on these landuses will pass through gross pollutant traps prior to discharging from the lot. The GPTs will focus on litter and coarse sediment. The GPTs will be owned and managed by the lot owners other than for sporting parks where the GPTs will be owned and managed by Council. GPTs have not been included in the MUSIC model as the focus of these in Aura South ERA is litter and coarse sediment.
Sediment basins	Sediment basins are proposed to manage stormwater from the larger catchments in the site. The basins will receive flows from the drainage network, remove coarse sediment with flows being transferred to adjacent bioretention systems. The proposed operation of the sediment basin and interaction with the subsequent bioretention systems is described in Section 5.2. The extended detention of the sediment basin and the bioretention system will engage at the same time, effectively increasing the extended detention storage to maximise flows through the bioretention filter media. During large events, overflows from the sediment basin bypass via a weir directly to the vegetated channel. A baseflow bypass will be designed into the sediment basins to avoid groundwater baseflow entering the bioretention systems.
Bioretention Systems	Bioretention systems are proposed to receive stormwater either directly from the stormwater drain networks or from the sediment basins in large catchments. Where flows directly enter the bioretention system, sediment forebays will be installed. Where there is a sediment basin upstream of the bioretention, the extended detention or active storages of the sediment basin and bioretention will combine ensuring more water can be treated through the bioretention filter media. Treated flow that collects in the bioretention underdrainage pipes will discharge into the vegetated channels or be discharged downstream. Design of the bioretention systems will occur in accordance with *Bioretention Technical Design Guideline* (Water by Design).
Vegetated channel	Within the drainage corridor, all flows from the bioretention systems will enter this vegetated channel. For treatment flows, no further treatment will occur. For the occasional 'overflows' which are not fully treated in the bioretention systems, additional treatment will occur in vegetated channel.

5 Design Principles

5.1 Rainwater Tanks

Rainwater tanks are an important part of Stockland's water conservation and stormwater management strategy for Aura South. Table 4 summaries the proposed tank approach for Aura South ERA which is consistent with the tank approach adopted in Aura. These have been written into the Plan of Development for Aura South ERA to ensure compliance with this Stormwater Quality Management Plan.

Table 4: Rainwater tank approach for Aura South ERA

Landuse	Roof Area	Tank size (minimum)	Tank Connections / Fixtures / Uses
Residential - Detached/attached dwellings (Lot >300m²)	50% roof area must connect / drain to tank	5kL per dwelling	Tanks must be connected to and supply water to all of the following: • Toilets (all toilets) • Laundry cold (all cold taps in laundry) • Outdoor taps (all outdoor taps)
Residential - Detached/attached dwellings (Lot = 225-300m²)	50% roof must connect / drain to tank	3kL per dwelling	Tanks must be connected to and supply water to all of the following: • Toilets (all toilets) • Laundry cold (all taps in laundry) • Outdoor taps (all outdoor taps)
Residential - Detached/attached dwellings (Lot <225m²)	No tanks		
Residential - Medium density dwellings	No tanks		
All non-residential uses including but not limited to: • Commercial • Retail • Industrial • School • Community	50% roof must connect / drain to tank If multiple buildings then 50% of total roof area must connect / drain to tank	1KL per toilet or urinal or 25kL/ha Minimum 5 KL size	Tanks must be connected to and supply water to all non-potable uses and fixtures including but not limited to: • Toilets (all toilets) • Urinals (all urinals) • Laundry cold (all taps in laundry) • Outdoor taps (all outdoor taps)

As most tanks will be privately owned, a maintenance and management plan will be provided as part of the detailed design and certification outlining ownership responsibilities, maintenance requirements, operational procedures and other measures necessary to ensure the tanks continue to operate as intended throughout the life of the development.

5.2 Sediment and Bioretention System Concept Designs

Conceptual design for the stormwater systems (i.e. sediment basin, bioretention systems and vegetated channels) involved a number of steps:

1. Resolving the function of the treatment systems (i.e. how they interact hydraulically to maximize treatment performance)
2. Identifying available space for treatment within the development layout and drainage corridor
3. Ensuring there is sufficient space for the contributing catchments
4. Completing MUSIC modelling to confirm treatment performance
5. Defining operating levels in the sediment basins and bioretention systems (using discharge levels into the channel to guide the design)
6. Optimising the drainage levels and associated earthworks in the development.

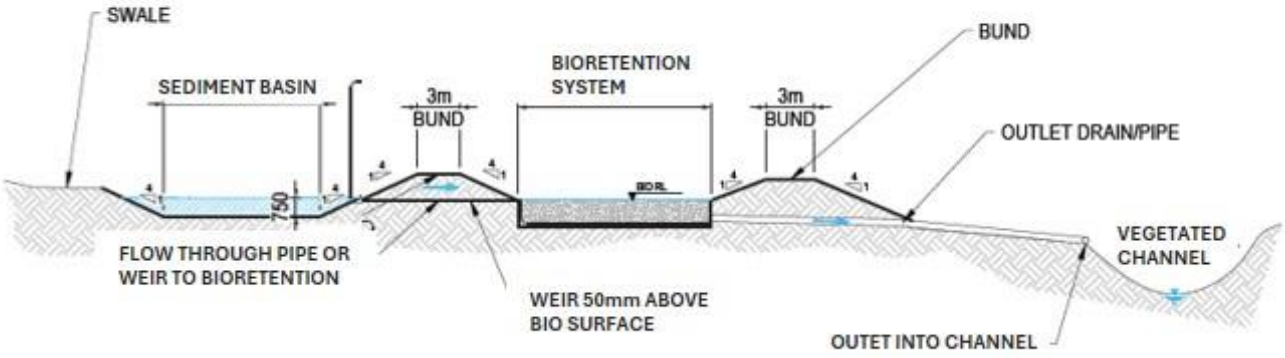
The following sections summarise the considerations and findings of this process.

5.2.1 Treatment system operation

The sediment basins and bioretention treatment systems receive flows from drainage pipes throughout the development. As flow enters the treatment systems it follows the sequence below (refer to Figure 7):

- Sediment basin - Flows from pipes enter the sediment basin where coarse sediment will settle out. During rainfall events, the sediment basins begin to fill and as water levels increase by more than 50mm they will overtop weirs or pipes into adjacent bioretention systems. A baseflow bypass will be provided within the sediment basin to bypass groundwater flows which can cause issues in bioretention systems.
- Bioretention – As flow increases from the sediment basin, water ponds over the bioretention by up to 300mm. The ponded water is combined with that over the sediment basin. As a storm ends, water then flows through the bioretention media (the majority). Treated flows from the bioretention systems will be discharged downstream.

The design of the treatment systems has undergone a conceptual design process to locate and size the systems in relation to the catchments and define design levels to ensure hydraulic function. Conceptual earthworks and cross sections are provided in Appendix A.



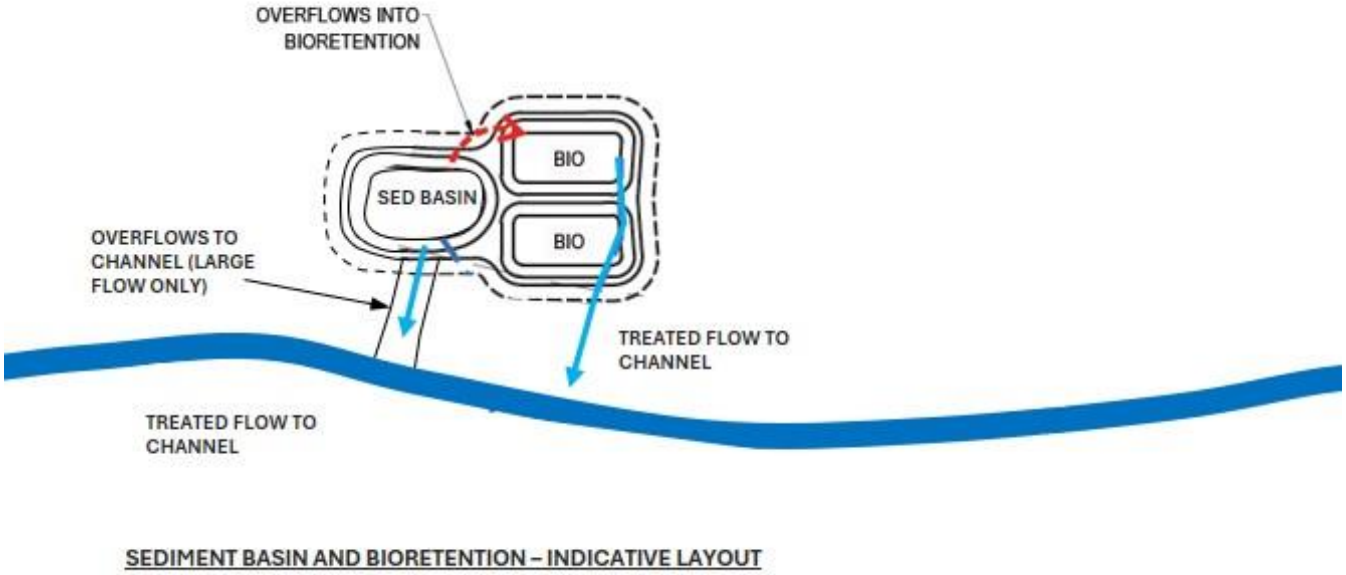


Figure 7 Function and operating levels sediment basin and bioretention treatment systems

5.2.2 Operating levels

A critical consideration of the precinct scale treatment systems is the operating levels and how the systems will discharge into the downstream vegetated channel or pipes. Figure 7 provides a conceptual cross section through the sediment basins and bioretention systems to illustrate how water will move through the systems and drain freely into the adjacent channel or pipes.

It shows there is 1.0-1.5m between the outfall levels in the vegetated channel or downstream drainage. The conceptual designs provided in Appendix A provide the operating and outlets levels for all the proposed stormwater management systems.

5.2.3 Location and size

The precinct scale sediment basins and bioretention systems have been carefully located considering the constraints including:

- Inflow stormwater drainage from the development
- Vegetated waterway
- Interaction with development edges to ensure there is space for the treatment systems
- Parkland
- Suitable discharge points for treated stormwater.

Sufficient space for the treatment areas as well as batters and access tracks etc. have been provided.

5.2.4 WSUD concept designs

Proposed sizes, shapes and configurations for sediment basins and bioretention systems were resolved by considering available areas for the treatment systems, catchments, required treatment areas and surveyed outfall levels. The operational principles as shown in Figure 7 were applied to develop the concepts.

Concept designs have been developed for all the end of line stormwater treatment systems to ensure there is enough space within the development layout (Appendix A). The stormwater treatment systems in Appendix A have been drawn to scale to match the areas defined in Table 2

The size and location of the stormwater treatment systems will 'evolve' in response to catchment changes or other constraints as part of design development and detailed design. There is sufficient redundancy and flexibility in the proposed designs to accommodate minor changes. On the basis of these concept designs, there is a high level of certainty that the proposed treatment strategy is feasible and can be implemented without changing the development layout. If there is a need to change the layout to allow for the stormwater strategy this will occur as part of future development approval variations.

6 Performance Assessment (MUSIC modelling)

6.1 MUSIC modelling approach

MUSIC modelling was undertaken to quantitatively assess the performance of the proposed stormwater strategy. MUSIC version 6.3 was used for the assessment and the parameters have been established in accordance with the *MUSIC Modelling Guidelines* (Water by Design, Draft 2018).

6.1.1 Model structure

The Aura South ERA MUSIC model layout is shown in Figure 8. Details of the modelling assumptions, parameters and results are provided below.

Table 5 provides a summary of the meteorological data on which the model is based.

Table 5 Meteorological and rainfall runoff data

Input	Data used in modelling
Rainfall station	40496 Caloundra (Updated)
Time step	6 minute
Modelling period	1997 – 2009
Mean annual rainfall	1,570 mm (for the period used)
Mean annual evapotranspiration	1,628 mm
Rainfall runoff parameters	Per SEQ MUSIC Guidelines
Pollutant export parameters	Per SEQ MUSIC Guidelines

6.1.2 Catchments

The stormwater catchments presented in Figure 6 were used and the various land uses (residential, commercial or parkland) within these catchments were measured. The model uses split land uses, so that particular areas could be directed to treatment while others may bypass (for example, roof runoff can be directed to tanks).

The details of the split catchments are shown in Table 6.

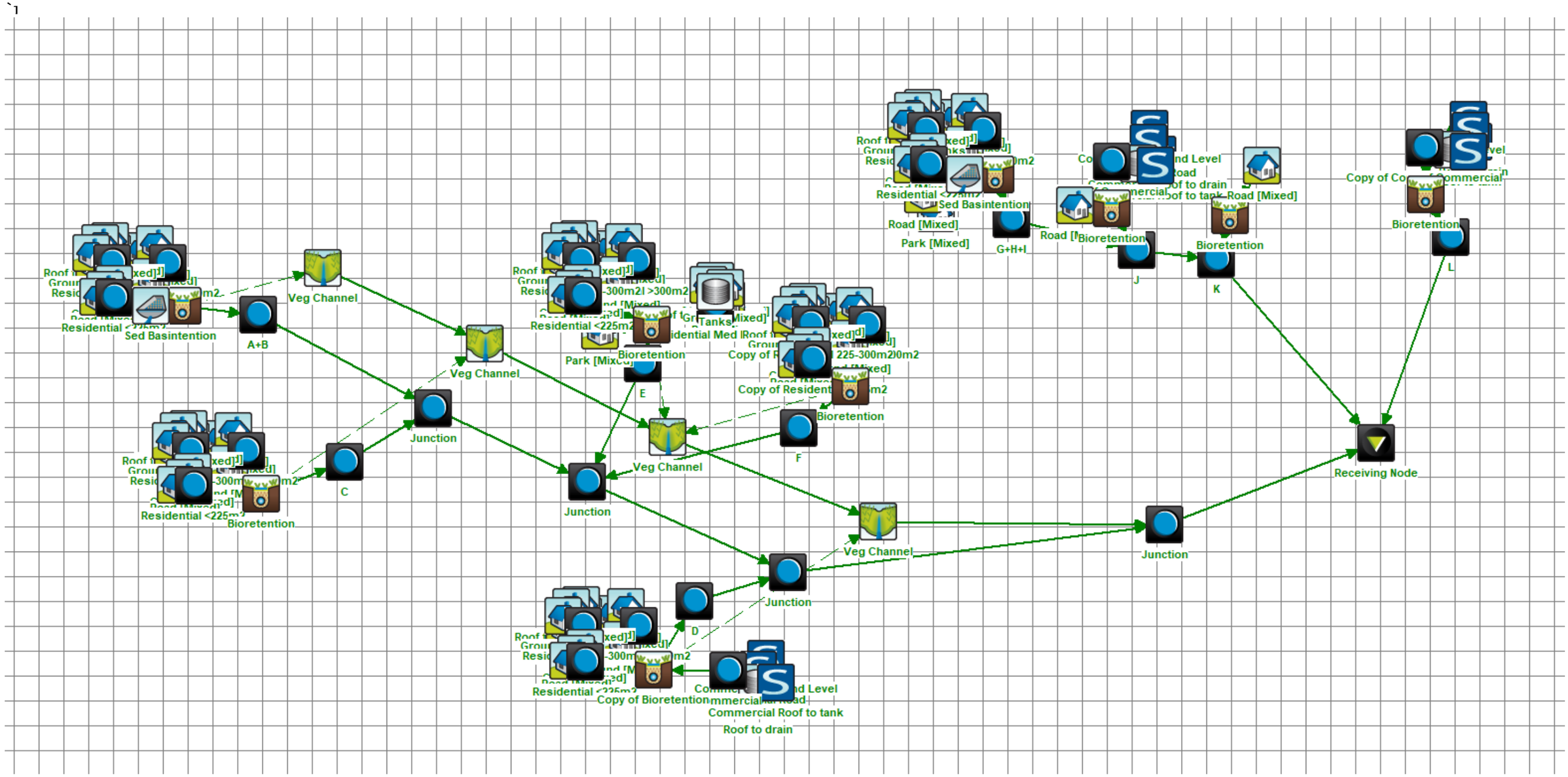


Figure 8 Aura South ERA MUSIC model layout

Table 6 Catchment land use area details

Catchment ID	Residential >300m²	Residential 225-300m2	Residential <225m2	Residential Medium Density	Commercial	School	Major Road/Rail	Park	Total
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
A+B	23.83	2.24	2.78						**28.85**
C	3.50	0.32	0.39						**4.21**
D	1.83	0.16	0.19		2.50				**4.68**
E	0.87	0.07	0.08	0.92				1.00	**2.94**
F	2.26	0.20	0.25						**2.70**
G+H+I	14.66	1.46	0.48				2.22	10.05	**28.87**
									-
									-
J					4.07		2.75		**6.82**
K							4.90		**4.90**
L					4.02				**4.02**
Total	**19.61**	**1.88**	**1.00**	**0.92**	**10.59**	**0.00**	**9.87**	**11.05**	**87.99**

Catchment ID	Residential >300m2				Residential 225-300m2				Residential <225m2			Residential Medium Density			Commercial				Major Road	Park	Total
	Roof to tank (ha)	Roof to drain (ha)	Road (ha)	Ground (ha)	Roof to tank (ha)	Roof to drain (ha)	Road (ha)	Ground (ha)	Roof to drain (ha)	Road (ha)	Ground (ha)	Roof (ha)	Road (ha)	Ground (ha)	Roof to tank (ha)	Roof to drain (ha)	Ground (ha)	Road/Parkng (ha)	(ha)	(ha)	(ha)
A+B	4.170	4.170	5.958	9.532	0.419	0.419	0.559	0.839	1.085	0.695	1.002										**28.850**
C	0.613	0.613	0.876	1.401	0.059	0.059	0.079	0.118	0.153	0.098	0.141										**4.210**
D	0.320	0.320	0.457	0.731	0.029	0.029	0.039	0.059	0.076	0.049	0.070				0.625	0.625	0.500	0.750			**4.680**
E	0.152	0.152	0.218	0.349	0.012	0.012	0.017	0.025	0.032	0.021	0.030	0.322	0.276	0.322						1.000	**2.940**
F	0.395	0.395	0.564	0.903	0.037	0.037	0.049	0.074	0.096	0.061	0.088										**2.700**
G+H+I	2.565	2.565	3.664	5.863	0.274	0.274	0.365	0.548	0.188	0.120	0.173								2.220	10.050	**28.870**
																					0.000
																					0.000
J															1.018	1.018	0.814	1.221	2.750		**6.820**
K																			4.900		**4.900**
L															1.005	1.005	0.804	1.206			**4.020**
Total																					**87.99**

6.2 Treatment systems

A summary of the treatment system sizes is shown in Table 3 and the characteristics for MUSIC modelling purposes of each treatment system are summarised below.

6.2.1 Rainwater Tanks

Rainwater tanks were modelled in accordance with *MUSIC Modelling Guidelines* (Water by Design) based on the sizes defined in Table 4.

6.2.2 Sediment Basins

The sediment basin area was defined with a minimum of 300m², although some larger sediment basin areas were adopted to suit the layout of the particular WSUD system. To derive the volume a notional depth of 1.5m in larger systems (>500m²) and 1m for systems smaller (<500m²) given the average depth in smaller systems is reduced to the surrounding underway batters.

6.2.3 Bioretention systems

The bioretention systems were modelled in accordance with the *MUSIC Modelling Guidelines* (Water by Design).

Where the bioretention systems are combined with sediment basins, the extended detention depth above the bioretention systems is configured to include the ponding depth above the sediment basin as well. This is because the two systems will 'share' this ponded water ensuring the vast majority of ponded water will filter through the bioretention media.

6.2.4 Vegetated Channel

The vegetated channel has been modelled to take untreated overflows from the treatments and have the following characteristics:

- Length = min 100m up to 400m in length (Length has been set based on proposed design)
- Varies 0.2-1%bed slope
- Base width = varies (min 5m)
- Top width = varies
- Depth = 500-800mm
- Vegetation height = 250mm
- Exfiltration = 0 mm/hour

6.3 Results

The results of the MUSIC modelling for Aura South ERA using the proposed strategy are shown in Table 7. The results indicate the water quality objectives are achieved under all modelling scenarios. The flow objective is achieved when evapotranspiration from the saturated zone, or low infiltration rates representative of clays (0.5 mm/hr), are included.

Compliance with the flow objective increases significantly when the measured in-situ infiltration rate is adopted of 6.85mm/hr. The flow removal increased to 48%.

Table 7 MUSIC modelling results

Parameter	Unmitigated	Mitigated	Removed	% Removed
Flow (ML/yr)	882	781 (679)	101 (203)	11.5% (23%)
TSS (kg/yr)	156,000	10,300	144,700	93%
TP (kg/yr)	319	9	280	88%
TN (kg/yr)	1,930	622	1,308	68%
Gross Pollutants (kg/yr)	18,000	0	18,000	100%

(Brackets) are the flow results when evapotranspiration is applied to a saturated zone or a very low rate of infiltration is applied (0.5mm/hr, clays) to the bioretention systems

7 Conclusions

This document describes a stormwater quality management strategy for Aura South Early Release Area designed to meet required stormwater management objectives (refer Section 3).

This stormwater quality management strategy covers 86ha of Aura. The development includes the creation of residential dwellings, small commercial area, sports fields and recreational park land uses. An additional 3.9ha of the Bells Creek Arterial (the entry into Aura South ERA) is also considered in the stormwater strategy and modelling.

This strategy proposes a comprehensive combination of treatment systems responding to the very high value receiving waters. Treatment will occur via precinct scale bioretention systems (primary treatment method) along with sediment basins and swale/vegetated channels integrated into linear corridors and open spaces. The treatment systems have been located within the constraints of site levels, available space and layout/earthworks. In addition, rainwater tanks are used on most allotments for water reuse in toilets and outdoor demands.

The proposed stormwater management measures proposed for Aura South ERA ensure the high level of stormwater treatment is achieved as required by the Aura South EPBC approval (2023/09548).

For flooding and waterway stability modelling and reporting for the site, please refer to *Aura South Early Release Area Flood Study* (Water Technology, November 2026).

8 References

Water by Design (2006), *Water Sensitive Urban Design Technical Design Guidelines for South East Queensland Version 1*. Moreton Bay and Waterways Catchments Partnership. Brisbane, Queensland.

Water by Design (2014), *Bioretention Chapter Technical Design Guidelines for South East Queensland.*

Water by Design (2018), *MUSIC Modelling Guidelines (DRAFT)*. Water by Design – Healthy Land and Water. Brisbane, Queensland.

Appendix A: WSUD Concepts

DATE PLOTTED: 2 November 2026 BY: STEPHEN TOLPUTT

NORTH

L = 4.02ha
BIO = 1005m²
(INTEGRATED INTO WSUD IN FUTURE PRECINCT)

K = 4.90ha
BIO = 1215m²

J = 6.82ha
BIO = 1,705m²

A+B = 28.95ha
SED BASIN = 500m²
BIO = 7,215m²

G+H+I = 28.87ha
SED BASIN = 500m²
BIO = 7,210m²

E = 2.94ha
BIO = 735m²

C = 4.21ha
BIO = 1,052m²

F = 2.70ha
BIO = 675m²

M = 2.16ha (FUTURE)
BIO = 540m²

N = 1.08ha (FUTURE)
BIO = 270m²

D = 4.68ha
BIO = 1,170m²

O = 4.59ha (FUTURE)
BIO = 1,150m²

LAYOUT PLAN
SCALE 1 : 3,000 (A1)

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PROJECT No: 4551
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NORTH

CHANNEL VEGETATED

WSUD A+B

SEDIMENT BASIN	= 500m²
BIORETENTION	= 7,215m²
SURFACE	= R.L.13.00
BASE	= R.L.12.00
BUND	= R.L.14.00

WSUD E

BIORETENTION	= 735m²
SURFACE	= R.L.11.50
BASE	= R.L.10.50
BUND	= R.L.12.50

1 IN 4 BATTER

1 IN 4 BATTER

1 IN 4 BATTER

I.L.8.50

I.L.8.40

OUTLET TO CHANNEL
I.L.10.325

OUTLET TO CHANNEL
I.L.8.50-8.60

WSUD C

BIORETENTION	= 1,052m²
SURFACE	= R.L.11.50
BASE	= R.L.10.50
BUND	= R.L.12.50

LAYOUT PLAN
SCALE 1 : 500 (A1)

10 0 10 20 30 40 50m
SCALE 1:500 @ A1 SCALE 1:1 000 @ A3

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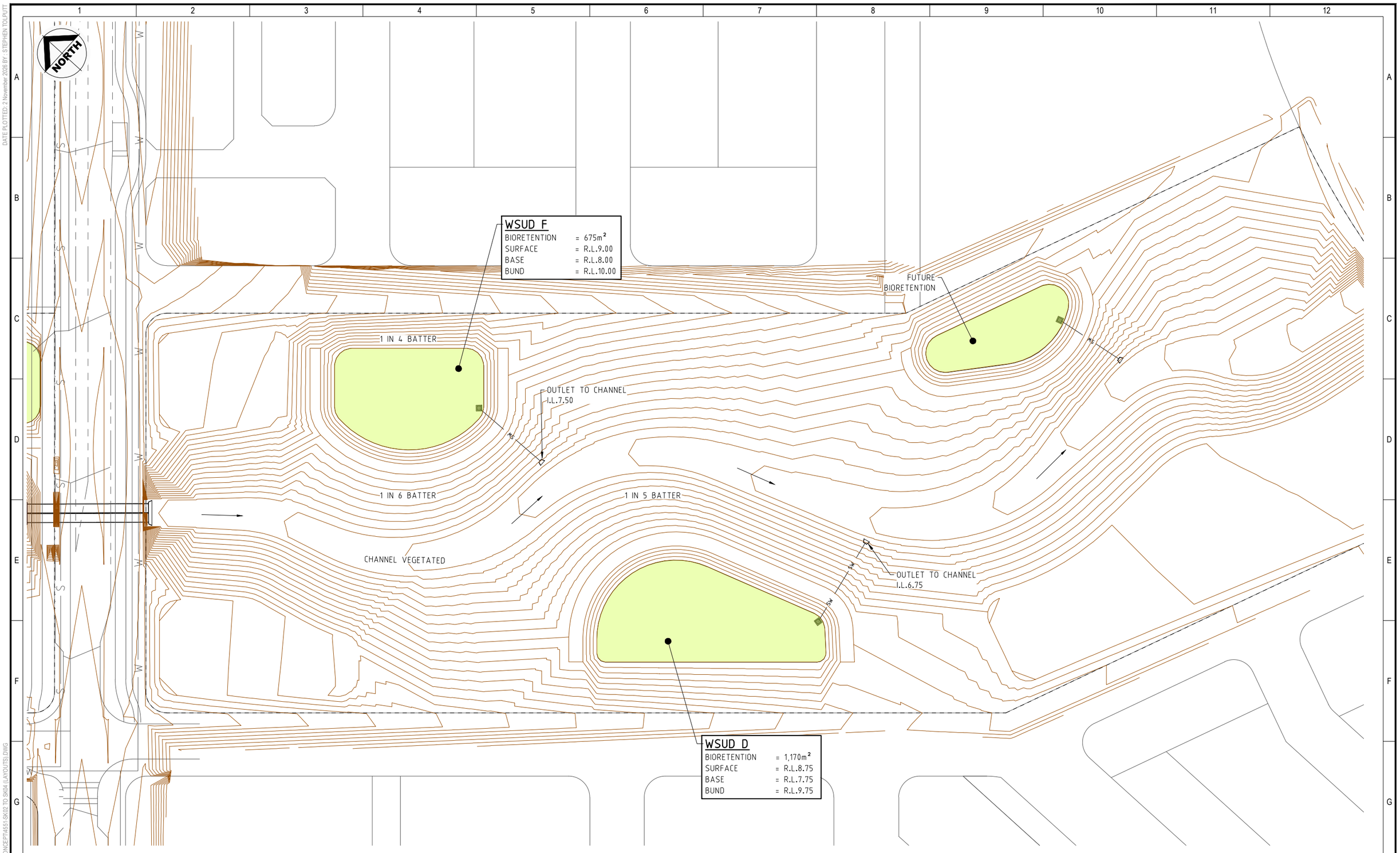
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DRAWING TITLE: DETAILED LAYOUT PLAN - SHEET 1 OF 3

PROJECT No	DRAWING No	REVISION
4551	SK02	B

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LAYOUT PLAN
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10 0 10 20 30 40 50m
SCALE 1:500 @ A1 SCALE 1:1 000 @ A3

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PROJECT	AURA SOUTH ERA
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PROJECT No	4551
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NORTH

WSUD J

BIORETENTION	= 1,705m²
SURFACE	= R.L.7.50
BASE	= R.L.6.50
BUND	= R.L.8.50

1 IN 4 BATTER

WSUD K

BIORETENTION	= 1225m²
SURFACE	= R.L.11.50
BASE	= R.L.10.50
BUND	= R.L.12.50

1 IN 4 BATTER

R.L.8.00

R.L.7.50

1 IN 4 BATTER

BUND R.L.10.0

R.L.7.00

BUND R.L.8.50

1 IN 4 BATTER

R.L.6.00

WSUD G+H+I

SEDIMENT BASIN	= 500m²
BIORETENTION	= 7,210m²
SURFACE	= R.L.6-9.0
DEPTH	= 1.0m (min.)
BUND HEIGHT	= 1.0m

LAYOUT PLAN
SCALE 1 : 500 (A1)

10 0 10 20 30 40 50m
SCALE 1:500 @ A1 SCALE 1:1 000 @ A3

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SCALE	A1
PROJECT	AURA SOUTH ERA
DRAWING TITLE	DETAILED LAYOUT PLAN - SHEET 3 OF 3
PROJECT No	4551
DRAWING No	SK04
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