WASTEWATER ASSESSMENT

Proposed Residential Development

7-9 Surf Parade, Broadbeach

Lot CP BUP3459 & CP BUP2545

For Hirsch & Faigen

9 April 2025

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Synopsis:	This Wastewater Assessment describes the site investigations completed and determines the impacts of the proposed development on the local wastewater networks and ensure the development can be serviced while satisfying relevant design criteria.

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1.0 INTRODUCTION

1.1 Background

OSKA Civil Consultants have been engaged by Hirsch & Faigen to prepare a wastewater network investigation in support of the proposed Residential Development at 7-9 Surf Parade, Broadbeach.

The objective of this investigation is to determine the impacts of the proposed Multi Unit Development on the local wastewater network and ensure the development can be serviced while satisfying relevant design criteria. Wastewater infrastructure have been adopted in accordance with The City of Gold Coast's (City's) Water Supply and Sewerage Infrastructure Plan 2019 (WSSIP) master planning servicing strategies.

1.2 Site Location

The proposed 100 unit multi-storey development is to be located at 7-9 Surf Parade, Broadbeach, as illustrated in Figure 1. The development is within The City's local government area who act as the responsible distributor-retailer water authority.

Figure 1: Approximate location of 7-9 Surf Parade proposed development

2.0 ASSUMPTIONS

This section details key assumptions made in 7-9 Surf Parade proposed development wastewater analysis.

2.1 Development Demands

The ultimate Equivalent Person (EP) demand for the proposed Residential Development has been nominated as 214 EP for both wastewater discharge and water supply loadings. The proposed development summary produced Rothelowman Architects was used as the basis to calculate the demand value adopted for the purposes of this assessment and is summarised in Table 1.

Table 1: Adopted development demand rates

Development Type	Demand Equivalent Conversion Rate	Quantity[1]	Demand (EP)[2]
Multi-Unit Dwelling 2 bedroom + MPR	2.51 EP / Dwelling	50	126
Multi-Unit Dwelling 2 bedroom	1.76 EP / Dwelling	50	88
		TOTAL	**214**

Notes: 1) Yields adopted as per development summary produced by Rothelowman Architects (March 2025)
2) ET/EP conversion rates adopted as per City of Gold Coast Water And Sewer Land Use Category Demand Table (A56369192) and rounded to nearest whole number.

The City has further requested that the impacts of additional ultimate (2066) demand from nearby approved development applications be assessed in the wastewater network analyses (approximately 2,496 EP respectively).

2.2 Desired Standards of Service

Key Design Standards of Service (DSS) adopted from the SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code) for wastewater are presented in Table 2.

Table 2: Key DSS adopted for water supply and wastewater

Design Criteria	Summary
Wastewater (adopted in accordance with the SEQ WS&S D&C Code)	
Average Dry Weather Flow (ADWF)	200 L/EP/d up to 2041 and 180 L/EP/d thereafter
Peak Wet Weather Flow (PWWF)	5 x ADWF
Emergency storage	4 hours at ADWF
Total pump station capacity	PWWF
Required pump station operating volume	0.9*Q/N
Gravity sewer performance criteria (Existing / New)	>1 m freeboard at PWWF / PWWF within 75% d/D
Rising main recommended velocities (Max. / Min.)	3 m/s / 0.75 m/s

3.0 WASTEWATER NETWORK ASSESSMENT

The wastewater network analysis has been undertaken in accordance with The City's 2019 WSSIP master planning service strategies.

3.1 Extent of Assessment

The sewerage impact assessment included the gravity main from the proposed development loading node to the downstream sewage pumping station (SPS) A025 as seen in Figure 2.

Figure 2: Existing wastewater infrastructure from the proposed development through to SPS A025 (shown in red)

All discharge from the proposed development have been loaded to node SEMH_A025_9000232663 on an existing DN300 main to the west of the site which gravity feeds approximately 850 m to SPS A025.

3.2 Flow and Emergency Storage Projections

The wastewater flow and emergency storage (ES) projections for the 7-9 Surf Parade development have been estimated in accordance with the SEQ WS&S D&C Code and are presented in Table 3.

Table 3: Wastewater flow and emergency storage projections

Site Loading	Demand (EP)	ADWF (L/s)	PWWF (L/s)	Additional ES Required (kL)
Existing (2021) WSSIP Demand	149	0.3	1.6	4.5
Proposed DA	214	0.4	2.2	6.4
Total Increase	**65**	**0.1**	**0.7**	**1.9**
Ultimate (2066) Approved DAs	2,496	5.20	26.0	74.9

Notes: 1) Proposed wastewater flow projections calculated in accordance with existing Conventional Sewer design criteria

The analysis indicates that the proposed development is expected to increase the existing (2021) PWWF discharge of the SPS A025 catchment by approximately 0.7 L/s.

It should be noted that there is also an additional ultimate (2066) demand of approximately 26.0 L/s PWWF from approved DAs in the SPS A025 catchment.

3.3 Network Modelling

Hydraulic modelling of the wastewater network was undertaken using the InfoSWMM model for Coombabah (CO_WSSIP_2019) provided by The City. The hydraulic modelling was completed to evaluate system performance under existing (2021) through to the ultimate (2066) planning horizon flow conditions, including additional approved DAs, both with and without the proposed development loading.

3.4 Impact Assessment

3.4.1 Gravity Mains

Key profiles of the gravity network immediately downstream of the proposed development to SPS A025 can be seen in Figure 3 and Figure 4.

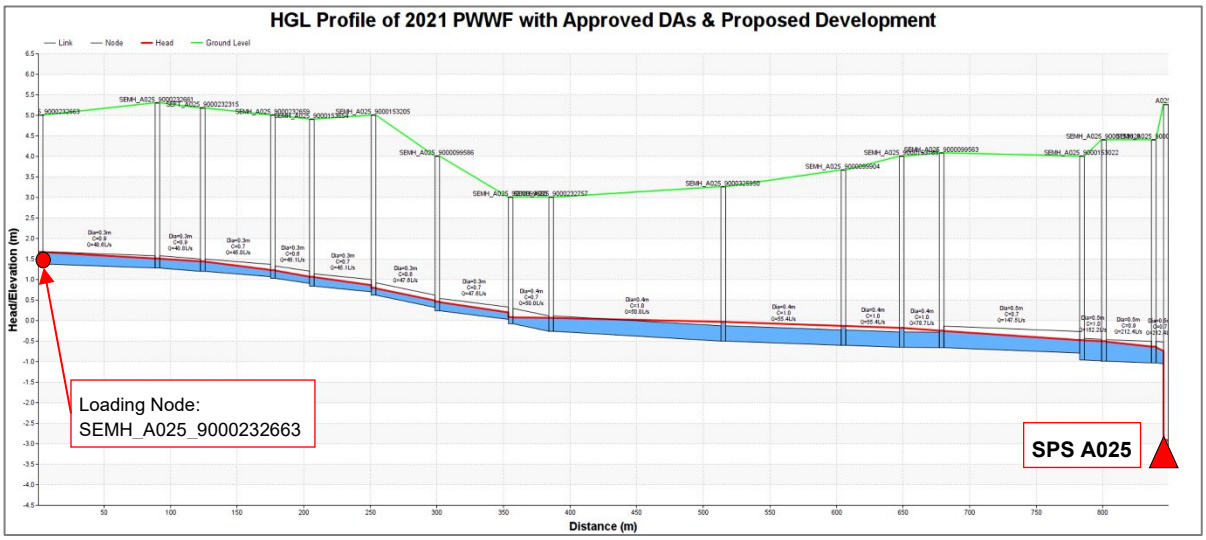

Figure 3: Downstream gravity network under existing (2021) PWWF including discharge from approved DAs and the proposed development

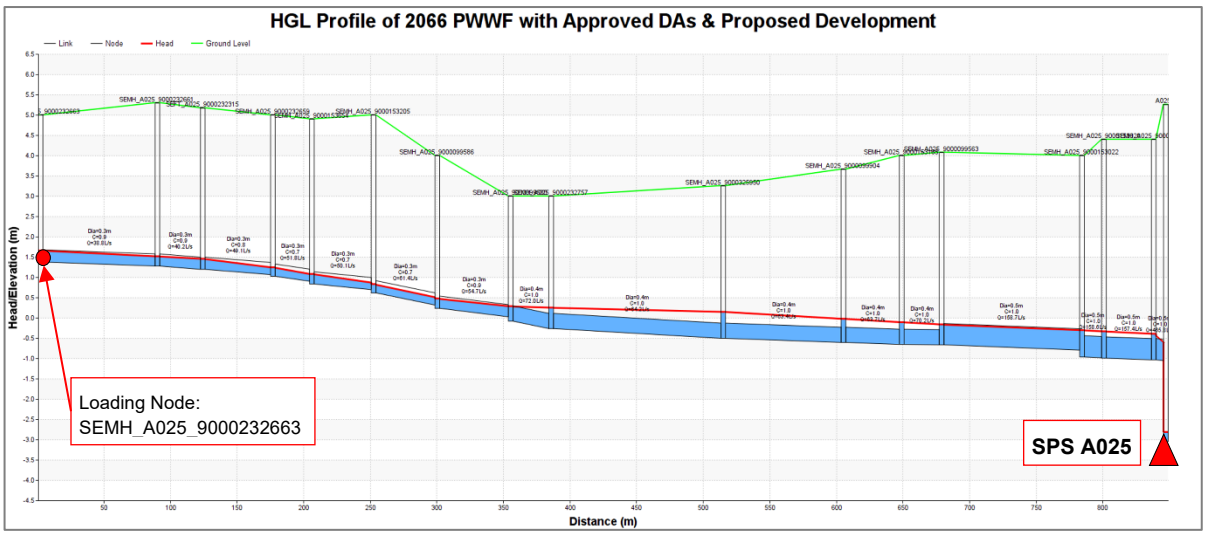

Figure 4: Downstream gravity network under ultimate (2066) PWWF including discharge from approved DAs and the proposed development

As illustrated in the gravity main profiles, the downstream sewer network adequately satisfies the 1 m freeboard criteria adopted by The City and has sufficient capacity to service the proposed 7-9 Surf Parade development from existing (2021) through to the ultimate (2066) planning scenario.

3.4.2 Sewage Pumping Station

A desktop assessment was completed using the discharge nominated in the Coombabah wastewater network model, CO_WSSIP_2019, to ensure that the proposed development could be adequately serviced by the existing pump station (SPS A025) and is summarised in the following sections:

3.4.2.1 Pump Capacity

Table 4: Flow requirements versus existing capacity

Planning Horizon	Maximum Capacity[1,2] (L/s)	PWWF (L/s)		
		Existing 2019 WSSIP[3]	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	**165.4** (258.8)	117.4	**210.1**	**212.6**
2026		143.5	**223.3**	**225.8**
2031	**465.7** (486)	172.4	236.6	239.1
2036		200.3	261.3	263.8
2041		231.4	284.2	286.7
2066	(489.7)	465.7	**491.7**	**492.4**

Note: 1) SPS A025 existing dual pumps capacity obtained from email received from The City of Gold Coast ME_WSSIP_2019 and model results (within brackets).
2) Email from The City states Pumps upgrade is proposed in 2031 and 2066.
3) Discharge for PWWF calculations obtained from the CO_WSSIP_2019 network models.

3.4.2.2 Operating volume

Table 5: Operating volume requirements versus existing capacity

Planning Horizon	Existing Capacity[1] (m^3)	Operating Volume Required (m^3)		
		Existing 2019 WSSIP[2]	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	**14.7**	6.2	11.0	11.2
2026		7.5	11.7	11.9
2031		9.1	12.4	12.6
2036		10.5	13.7	13.9
2041		12.1	**14.9**	**15.1**
2066		24.4	**25.8**	**25.8**

Note: 1) SPS A025 existing operating storage volume obtained from email received from The City of Gold Coast
2) Discharge for PWWF calculations obtained from the *CO_WSSIP_2019* network models.

3.4.2.3 Rising Main

Table 6: Rising main velocities

Planning Horizon	Rising Main Internal Diameter[1] (mm)	Velocity @ Ultimate (2066) PWWF (m/s)		
		Existing 2019 WSSIP	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	**294.6**	1.7	**3.1**	**3.1**
2026		2.1	**3.3**	**3.3**
2031	**694.6**	2.5	**3.5**	**3.5**
2036		2.9	**3.8**	**3.9**
2041		**3.4**	**4.2**	**4.2**
2066		**6.8**	**7.2**	**7.2**

Note: 1) Diameters obtained from the *CO_WSSIP_2019* network model

3.4.2.4 Emergency Storage

Table 7: Emergency storage requirements versus existing capacity

Planning Horizon	Available Emergency Storage[1] (kL)	Emergency Storage Required for 4hrs @ADWF (kL)		
		Existing 2019 WSSIP[2]	With Approved DAs	With Approved DAs & Proposed Development
Existing (2021)	**1,325.7**	290.1	557.3	564.5
2026	**1,322.0**	362.2	592.0	599.2
2031	**1,293.3**	442.2	626.9	634.0
2036	**1,291.6**	519.0	694.9	702.0
2041	**1,288.4**	605.3	757.5	764.6
2066	**1,378.8**	1,201.4	1,276.3	1,278.3

Note: 1) SPS A025 existing available emergency storage volume obtained from email received from The City of Gold Coast
2) Discharge for PWWF calculations obtained from the *CO_WSSIP_2019* network models.

The desktop assessment of SPS A025 has concluded that the pump station has insufficient capacity to service the proposed development under existing (2021), intermediate (2026) and ultimate (2066) planning horizons. However, hydraulic analysis using WSSIP19 model pump curves indicates a significantly different maximum pump capacity that has sufficient capacity to service demands from the existing WSSIP19 as well as the proposed development. It is recommended this discrepancy is confirmed with The City.

Wet well volume has been calculated less than recommended design specification beyond the intermediate (2036) planning horizon.

With the inclusion of approved DAs, the SPS A025 rising main fails to meet SEQ WS&S D&C Code recommendations for maximum velocity of 3 m/s in all planning horizons. The WSSIP19 proposed DN750 rising main duplication to be constructed in 2031 fails to meet existing network demands beyond the intermediate (2036) planning horizon.

It should be noted that the pump capacity and downstream rising main failures at SPS A025 is significantly impacted by already approved developments within the SPS A025 catchment and requires an upgrade prior to the previously nominated 2031 planning horizon regardless of the discharge from the proposed development. Discharge from the proposed development account for approximately 0.14% of the ultimate (2066) catchment demand.

Emergency storage withing the A025 catchment was found to have adequate capacity to satisfy SEQ WS&S D&C Code recommendations for all planning horizons assessed.

Hydraulic analysis was undertaken using full network model runs for all scenarios to substantiate the desktop assessment findings and capacities noted within. Network modelling results of SPS A025 dual pump capacities confirm the capacities advised by The City of Gold Coast which are insufficient to service the approved developments and proposed development within the catchment under the existing (2021) planning horizon.

3.5 Conclusion and Recommendations

Analysis of the wastewater network has concluded that there is currently sufficient capacity in the existing (2021) through ultimate (2066) gravity networks to service the proposed development while satisfying SEQ WS&S D&C Code recommendations.

However, the desktop investigation has identified potential pump capacity, pump operating volume and rising main shortcomings at SPS A025. Therefore, SPS A025 may not be operating with sufficient capacity to service the approved DAs and proposed development under the existing (2021) through ultimate (2066) planning horizons. It should be noted the pump capacity shortfalls occur prior to the addition of demands associated with the proposed development and are not significantly worsened by the proposed development. Discharge from the proposed development accounts for approximately 0.14% of the ultimate (2066) catchment demand.

It is therefore suggested that the proposed development of approximately 214 EP be approved with respect to adequate wastewater network capacity, with the following recommendations:

- The developer liaises with The City to confirm that the modelled SPS A025 pump capacities noted are reflective of maximum operating capacity and can meet demands associated with the existing network discharge as well as the proposed development, while satisfying SEQ WS&S D&C Code recommendations.
- The developer liaises with The City to confirm that the WSSIP19 proposed DN750 rising main duplication (proposed for 2031) can be revised and constructed in a timely manner to account for discharge from approved DAs and the proposed development, while meeting SEQ WS&S D&C Code recommendations for maximum velocity.