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SEWER NETWORK ANALYSIS REPORT

Proposed Townhouse Units at
10 Poole Way, Bushland Beach

TOWN PLANNING
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SEWER NETWORK ANALYSIS REPORT

Proposed Townhouse Units at
10 Poole Way, Bushland Beach
for
Poole Way Pty Ltd

B4818E_SEW – Revision A
19th February 2026

JFP Urban Consultants Pty Ltd
Prepared by: Elizabeth Kenneally & Rowell Umale
Approved by: Haydn Watson (RPEQ 6200)

Revision History

Revision	Date	Details
A	19/02/2026	Issue for TCC approval.

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1 INTRODUCTION

JFP Urban Consultants Pty Ltd was engaged to carry out a sewer network analysis and prepare a report to accompany a Townsville City Council (TCC) connection application for a townhouse development comprising of 20 units at 10 Poole Way, Bushland Beach on Lot 4 SP333154. A Site Layout Plan is shown in Figure 1 and a Site Layout Plan ***Drawing No. 7340-DA03*** by Blackburne Jackson is provided in Appendix A.

Figure 1: Proposed Townhouse Units' Development Site Layout Plan

2 BACKGROUND

2.1 SITE LOCALITY

The proposed development site is currently located within the TCC Sewer Service Connection Area for the WB12 catchment area as shown in Figure 2. The site covers 0.47 ha and ranges in elevation from 5.5m AHD to 7.5m AHD. The site currently adjoins a stormwater reserve to the north, a vacant lot to the west, Poole Way to the south and Mount Low Parkway to the east. Figure 3 shows an aerial view of the site with contours.

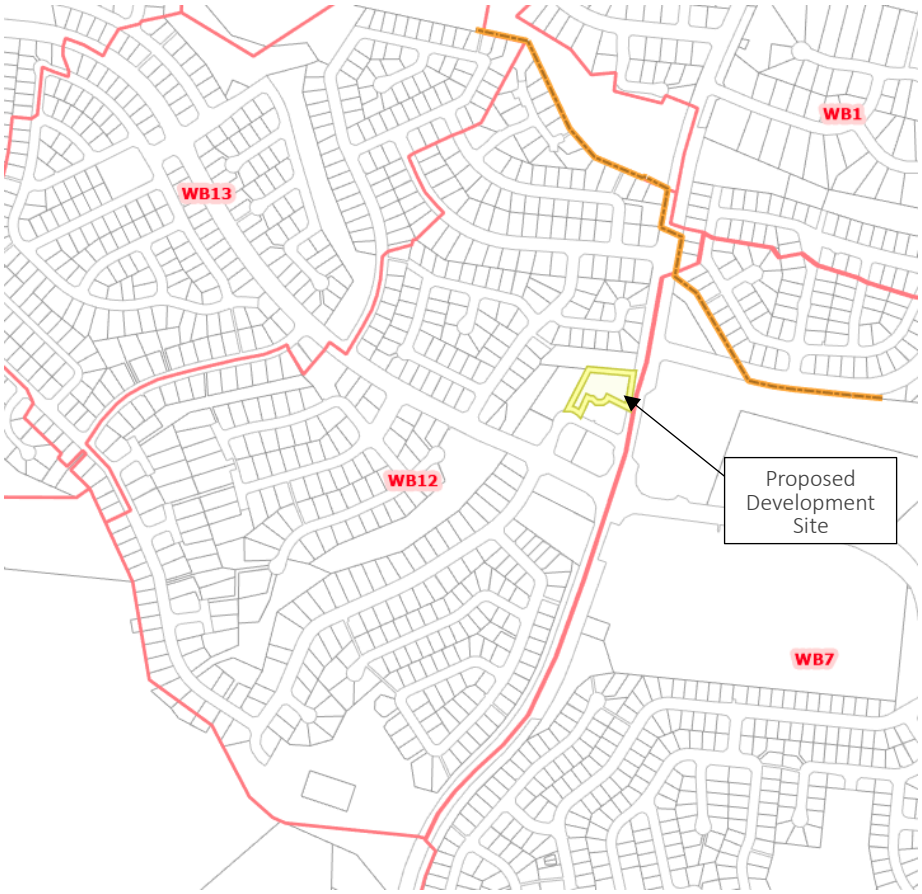


Figure 2: Proposed Development Locality and TCC Sewer Service Connection Areas

Figure 3: Proposed Development Site Aerial View and Contours

2.2 SEWER NETWORK INFRASTRUCTURE

2.2.1 EXISTING NETWORK

The proposed development is located in the Mount St John Wastewater Treatment Plant (WWTP) network catchment. The proposed development will discharge into network gravity mains within Sewage Pump Station (SPS) P/S WB12 catchment. PS/WB12 receives the flows and pumps directly to the Mount St John WWTP via a common rising main. The common rising main services multiple pump stations throughout the WWTP network within the Mount St John, Bohle, Burdell, Mount Low and Bushland Beach areas. The downstream path from the proposed development site to the WWTP is shown on Figure 4.

Figure 4: Proposed Development Site Downstream Path to WWTP

Figure 5 shows the sewer reticulation network near the vicinity of the site, in particular highlighting the downstream DN150 and DN225 sewer gravity mains from the proposed development site to P/S WB12.

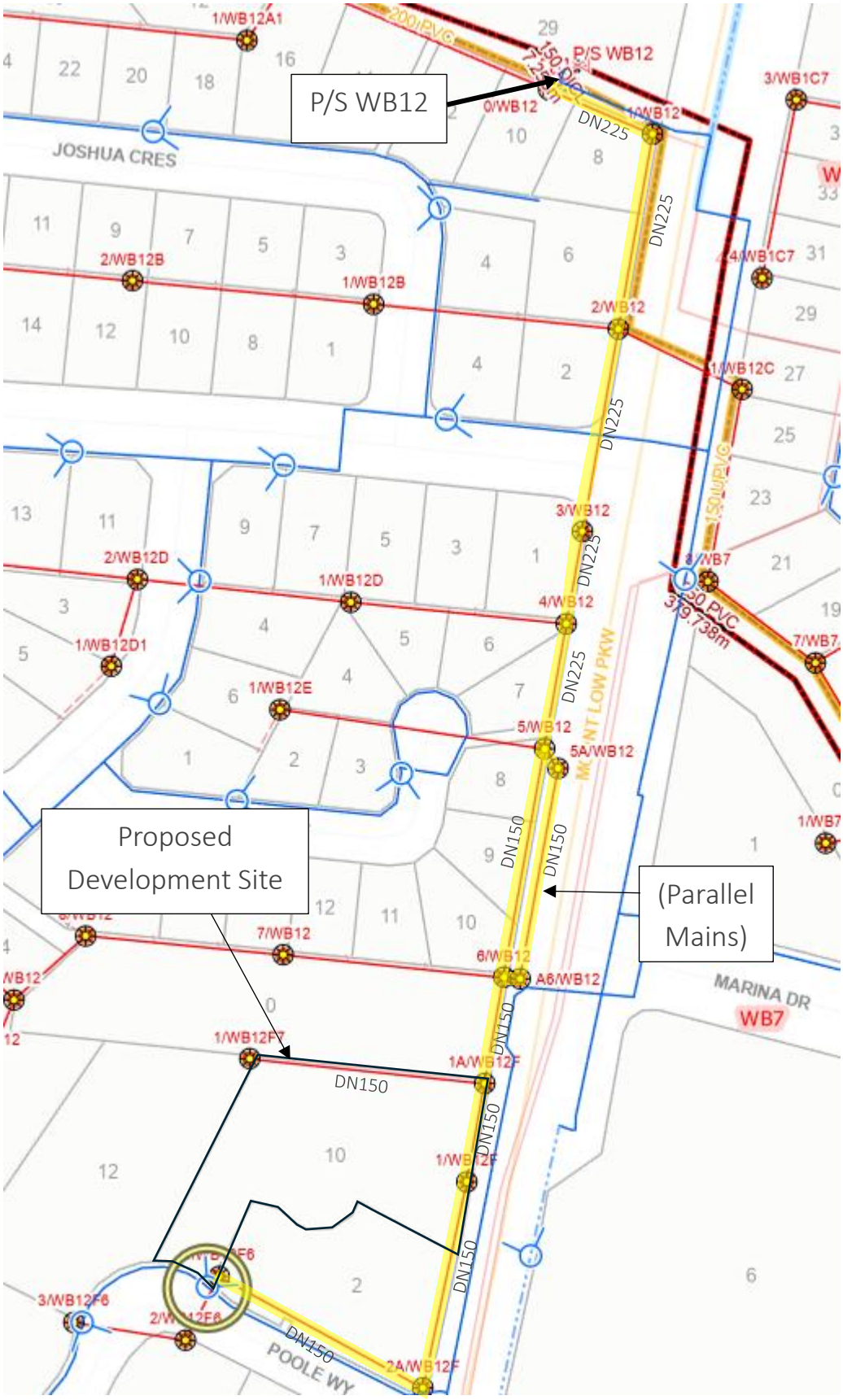


Figure 5: Sewer Reticulation Network near the Vicinity of the Proposed Development Site

2.2.2 PLANNED NETWORK AUGMENTATIONS

There are no planned upgrades identified for the P/S WB12 catchment identified from the TCC Planning Scheme LGIP schedule of works trunk upgrade mapping.

3 SEWER CONNECTION STRATEGY

The proposed development will have a single sewer branch connection onto the DN150 sewer gravity mains adjacent to the site. Based on the site contours existing manhole 1A/WB12F at the site low point at the north-east of the site would be suitable to accommodate internal plumbing sewers extending to service each of the units. This manhole has been nominated as the site connection for the purposes of the network analysis. The arrangement is shown on Figure 6.

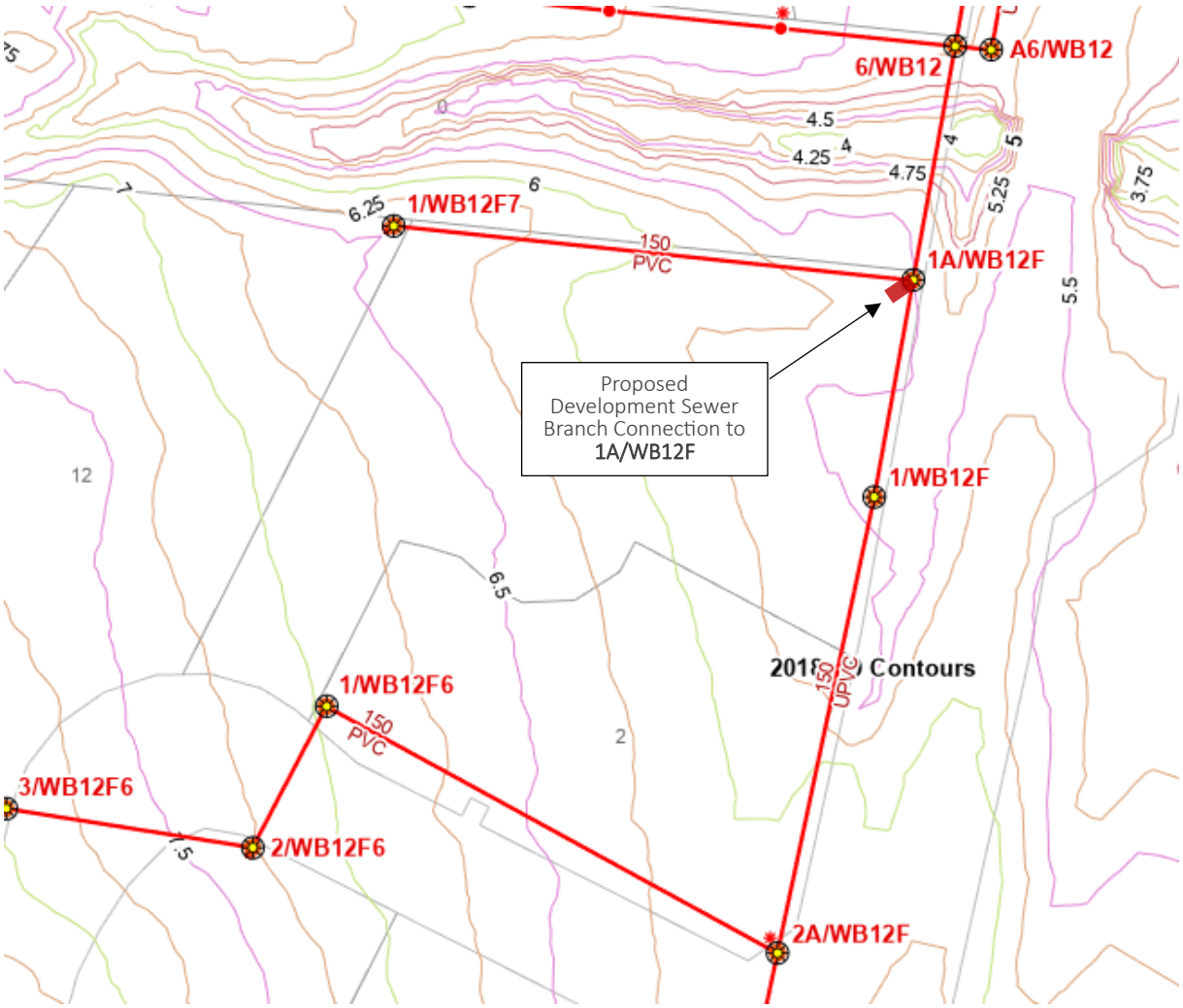


Figure 6: Proposed Development Sewer Network Connection

4 SEWAGE LOAD ESTIMATE

Equivalent Persons (EPs) was used as the base unit to determine the expected sewage loading of the proposed development. The TCC Planning Scheme Local Government Infrastructure Plan (LGIP) Extrinsic Material includes an LGIP Projections and Densities 2019 document which lists the following loading conversions adopted for the network analysis:

- Housing – 1.8 EP per Unit Dwelling

Table 1 below summaries the EP calculation for the proposed development based on the figures above.

Table 1: Summary of Proposed Development Sewage EP Estimate

Development Description	No.	EP Unit Rate	Type	EP
Townhouse Unit	20	1.8 EP per Unit Dwelling	Res	36
			Total EP	36

5 SEWER NETWORK DESIGN CRITERIA

The sewer network was modelled in accordance with the CTM Water Alliance Design and Construction Code (CTM Water Code) design parameters as listed below:

- Average Dry Weather Flow (ADWF) = 230 L/EP/day
- Peak Dry Weather Flow (PDWF) = C_2 x ADWF
  Where $C_2 = 4.7 \times EP^{-0.105}$
- Peak Wet Weather Flow (PWWF) = 5 x ADWF or C1 x ADWF (whichever is larger)
  Where $C1 = 15 \times EP^{-0.1587}$
- Depth of flow at PWWF for new sewers = less than 0.75 of pipe diameter
- Minimum gravity main slope DN150 = 1:100m for the first 10 allotments
  = 1:180m remaining lengths
  DN225 = 1:300m
- Minimum velocity gravity mains at PWWF = 0.75 m/s
- Target velocity in rising main = 0.75 to 1.5 m/s
- Maximum velocity in rising mains = 2.5 m/s

The proposed development 36 EP represents the following flowrates based on 230 L/ EP/day:

Average Dry Weather Flow (ADWF) = 0.10 l/s
Peak Wet Weather Flow (PWWF) = 0.85 l/s (C1 x ADWF, $C1 = 15 \times EP^{-0.1587} = 8.49$)

6 SEWER HYDRAULIC MODELLING

A sewer network boundary conditions request was issued to TCC and a copy of the response, dated 14th January 2026, is attached in Appendix B. TCC provided the existing ADWF and PWWF flow depths for the DN150/DN225 sewer gravity main from existing MH 2A/WB12F, near the site, to SPS P/S WB12 wet well (shown on Figure 5). Based on the PS/WB12 catchment area appearing to be fully developed with recent residential subdivisions, it is expected that the existing flow depths will be suitable to assess the proposed development connection based on no additional major loading in the catchment or zone density increase for the area in future.

The subject line was created in a new InfoWorks ICM model based on TCC's online GIS infrastructure mapping as shown on Figure 7 to assess the network performance. Sewage loading was added onto the line to replicate the existing PWWF flow depths nominated on the TCC Boundary Conditions Response. Table 2 shows a summary of the depths and comparison to the model results. The model results were within 3% of the flow depths and considered acceptable to carry out the network analysis. P/S WB12 was modelled as an outflow. P/S WB12 was not assessed based on TCC not providing capacity information for assessment in the Boundary Conditions Response. It is also noted that the proposed development site is within the P/S WB12 catchment area and expected to be included in P/S WB12 design capacity based on the existing Low-Density Residential zoning.

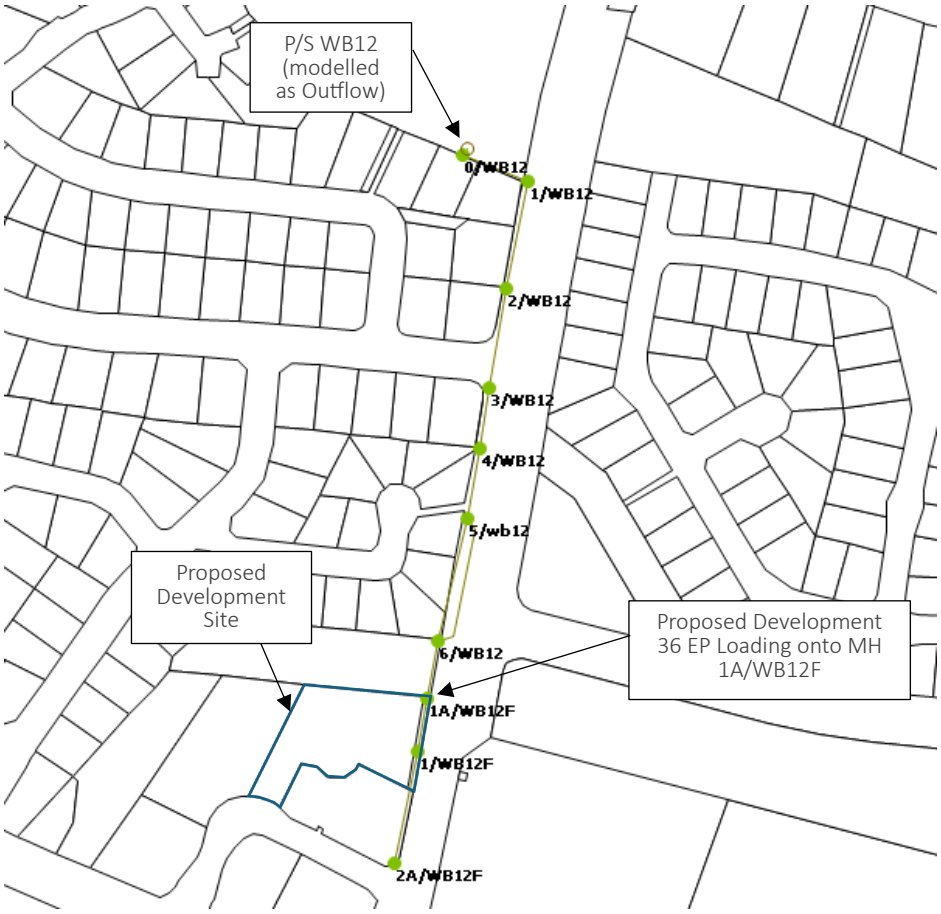


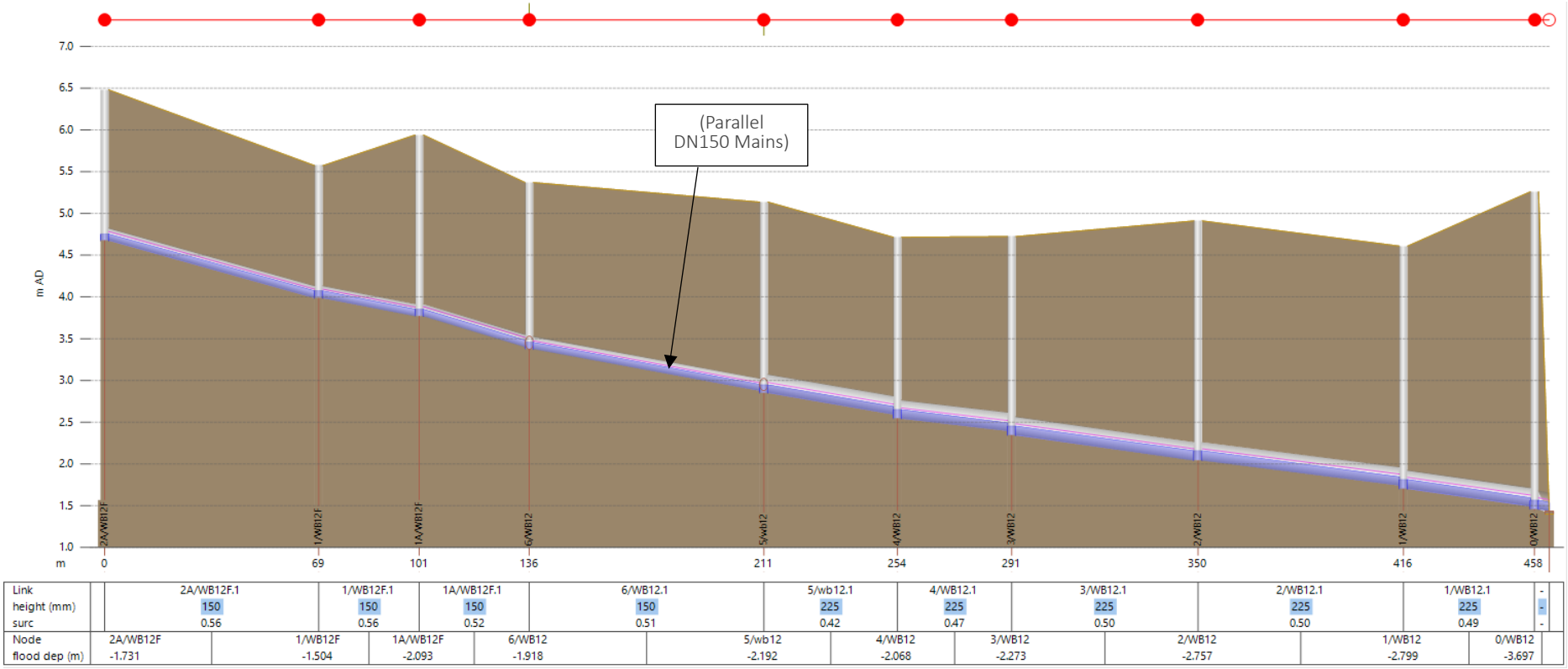
Figure 7: Hydraulic Model Screenshot – Modelled Sewer Gravity Main from MH 2A/WB12F to P/S WB12

Table 2: Sewer Gravity Main Comparison of Flow Depths Boundary Conditions vs. Modelled

U/S MH	D/S MH	Diameter (mm)	Boundary Conditions Max Depth of Flow (%D)	Modelled Max Depth of Flow (%D)	Difference (%D)
2A/WB12F	1/WB12F	150	55.7	56	0.3
1/WB12F	1A/WB12F	150	55.7	56	0.3
1A/WB12F	6/WB12	150	47.8	49	1.2
6/WB12	5/WB12	150	49	49	0
5/WB12	4/WB12	225	41	41	0
4/WB12	3/WB12	225	46.8	46	-0.8
3/WB12	2/WB12	225	51.7	49	-2.7
2/WB12	1/WB12	225	49	49	0
1/WB12	0/WB12	225	47.9	47	-0.9
0/WB12	P/S WB12	225	44.8	47	2.2

6.1 SEWER MODELLING RESULTS

The proposed development estimated 36 EP PWWF loading was added onto the line at MH 1A/WB12F. The resultant maximum Hydraulic Grade Line (HGL) Profile is shown on Figure 8 and the pipe depths are shown on Table 3. The graph shows that maximum flow depths will not exceed the maximum 75% of pipe depths network criteria. The highest depth of flow will be 58%. The results show the existing sewer gravity main will have adequate capacity to accommodate the proposed development connection.



Link	2A/WB12F.1	1/WB12F.1	1A/WB12F.1	6/WB12.1	5/wb12.1	4/WB12.1	3/WB12.1	2/WB12.1	1/WB12.1	-
height (mm)	150	150	150	150	225	225	225	225	225	-
surc	0.56	0.56	0.52	0.51	0.42	0.47	0.50	0.50	0.49	-

Node	2A/WB12F	1/WB12F	1A/WB12F	6/WB12	5/wb12	4/WB12	3/WB12	2/WB12	1/WB12	0/WB12
flood dep (m)	-1.731	-1.504	-2.093	-1.918	-2.192	-2.068	-2.273	-2.757	-2.799	-3.697

Figure 8: Maximum HGL – SGM Line MH 2A/WB12F to P/S WB12 – PWWF Scenario – Development Loading Add

Table 3: Pre and Pos Development Maximum Depth of Flow

U/S MH	D/S MH	Pre-Dev Max Depth of Flow (%D)	Post-Dev Max Depth of Flow (%D)	Difference (%D)
2A/WB12F	1/WB12F	56	56	0
1/WB12F	1A/WB12F	56	56	0
1A/WB12F	6/WB12	49	52	3
6/WB12	5/WB12	49	51	2
5/WB12	4/WB12	41	42	1
4/WB12	3/WB12	46	47	1
3/WB12	2/WB12	49	50	1
2/WB12	1/WB12	49	50	1
1/WB12	0/WB12	47	49	2
0/WB12	P/S WB12	47	48	1

6.2 SEWER NETWORK INFRASTRUCTURE REQUIREMENTS

Based on the sewer network analysis, there are no new external sewer network augmentations required in the network to cater for the proposed development connection.

7 CONCLUSIONS AND RECOMMENDATIONS

JFP Urban Consultants Pty Ltd was engaged to carry out a sewer network analysis and prepare a report to accompany a Townsville City Council (TCC) connection application for a townhouse units' development comprising of 20 units at 10 Poole Way, Bushland Beach on Lot 4 SP333154.

The conclusions and recommendations of the network analysis are listed below:

- The proposed development site is currently located within the TCC Sewer Service Connection Area for the WB12 catchment area

- The proposed development is located in the Mount St John Wastewater Treatment Plant (WWTP) network catchment. The proposed development will discharge into network gravity mains within Sewage Pump Station (SPS) P/S WB12 catchment. PS/WB12 receives the flows and pumps directly to the Mount St John WWTP via a common rising main. The common rising main services multiple pump stations throughout the WWTP network within the Mount St John, Bohle, Burdell, Mount Low and Bushland Beach areas.

  There are no planned upgrades identified for the P/S WB12 catchment identified from the TCC Planning Scheme LGIP schedule of works trunk upgrade mapping.

- The proposed development will have a single sewer branch connection onto the DN150 sewer gravity mains adjacent to the site. Based on the site contours existing manhole 1A/WB12F at the site low point at the north-east of the site would be suitable to accommodate internal plumbing sewers extending to service each of the units. This manhole has been nominated as the site connection for the purposes of the network analysis.

- Equivalent Persons (EPs) was used as the base unit to determine the expected sewage loading of the proposed development. The proposed development represents a total of 36EP which represents the following design flowrates.

  Average Dry Weather Flow (ADWF) = 0.10 l/s
  Peak Wet Weather Flow (PWWF) = 0.85 l/s

- A sewer network boundary conditions request was issued to TCC and a copy of the response, dated 14th January 2026, is attached in Appendix B. TCC provided the existing ADWF and PWWF flow depths for the DN150/DN225 sewer gravity main from existing MH 2A/WB12F, near the site, to SPS P/S WB12 wet well.

  The subject line was created in a new InfoWorks ICM model based on TCC's online GIS infrastructure mapping to assess the network performance. Sewage loading was added onto the line to replicate the existing PWWF flow depths nominated on the TCC Boundary Conditions Response and the proposed development estimated 36 EP PWWF loading was added onto the

line at MH 1A/WB12F. P/S WB12 was not assessed based on TCC not providing capacity information for assessment in the Boundary Conditions Response. It is also noted that the proposed development site is within the P/S WB12 catchment area and expected to be included in P/S WB12 design capacity based on the existing Low-Density Residential zoning.

- The sewer modelling results on the subject line shows that maximum flow depths will not exceed the maximum 75% of pipe depths network criteria. The highest depth of flow will be 58%. The existing sewer gravity main will have adequate capacity to accommodate the proposed development connection.

  There are no new external sewer network augmentations required in the network to cater for the proposed development connection.

It is recommended that the sewer connection application for the proposed development be approved based on the conclusions and recommendations of the above sewer network analysis.

8 APPENDICES

8.1 APPENDIX A: DRAWING NO. 7340-DA03

02 SITE PLAN LEVEL 1
1:200

PROPOSED TOWNHOUSE DEVELOPMENT , 10 POOLE WAY, BUSHLAND BEACH

POOLE WAY PTY LTD

SITE PLAN LEVEL 1

PRELIMINARY
scale : 1:200 @A1 1:400@A3
issue : 04 date : 22-10-25

7340-DA03

north

BLACKBURNE JACKSON
ARCHITECTURE | LANDSCAPE | INTERIOR | PROJECT MANAGEMENT

8.2 APPENDIX B: TCC NETWORK MODEL BOUNDARY CONDITIONS RESPONSE

Appendix A Form for provision of Water and Sewer Network Boundary Condition Advice

This form can be modified to suit individual applications. The form is for the provision of boundary condition advice by TCC in response to a request for boundary conditions by an external stakeholder via Form M1: Request for Network Modelling Information.

Council advises that the water network model used to determine the boundary condition advice and commentary provided herein has not been calibrated. Results obtained via the use of the model have not been physically verified.

This advice does not include an assessment of available network storage reserves, nor does it include advice or commentary on the suitability of existing available reserves in the network for the purpose of satisfying published service standards for firefighting or any other condition.

Boundary condition advice or any other advice obtained via the use of the model for any purpose remains solely at the risk of the applicant. Verification of boundary condition advice resides solely with the applicant. The provision of this report to the applicant infers that the applicant has reviewed, acknowledged and accepted the Advice Conditions presented herein.

Date: 14/1/2026 TCC Reference: 22446724

Application details:

Name:	Rowell Umale
Contact No:	0433952999
Development name and address:	JFP Urban Consultants Pty Ltd & 10 Poole Way Bushland Beach
Development type:	MCU25/0084

Water boundary condition advice:
Townsville City Council will provide the peak hour boundary conditions. Any modelling and analysis will need to be completed by the applicant's engineering team.

MCU25/0084 - Multiple Townhouse Dwelling (20 x 3 Bedroom Units)

Location:	10 Poole Way
	Water pressure (kPa)
Peak hour @19:00	493 kPa
Peak hour fireflow	482 kPa @ 10L/s 473 kPa @ 15L/s 460 kPa @ 20L/s

Note: these are theoretical values and it is the responsibility of the applicant to verify values via flow and pressure test undertaken on site during peak hour at the closest point to the development.

Sewer boundary condition advice:
Townsville City Council (TCC) will provide existing Average Dry Weather Flow(ADWF) and existing Peak Wet Weather Flow (PWWF) boundary conditions. Any modelling and analysis will need to be completed by the applicant's engineering team.

- For Existing ADWF scenario:

U/S MH	D/S MH	Diameter (mm)	Max Depth of Flow (%D)	V (m/s)
2A/WB12F	1/WB12F	150	23.6	0.52
1/WB12F	1A/WB12F	150	23.6	0.3
1A/WB12F	6/WB12	150	20.9	0.53
6/WB12	5/WB12	150	21.3	0.45
5/WB12	4/WB12	225	18.1	0.53
4/WB12	3/WB12	225	20.3	0.43
3/WB12	2/WB12	225	22.1	0.45
2/WB12	1/WB12	225	21.1	0.44
1/WB12	0/WB12	225	20.7	0.46
0/WB12	P/S WB12	225	19.6	0.63

- For Existing PWWF scenario:

U/S MH	D/S MH	Diameter (mm)	Max Depth of Flow (%D)	V (m/s)
2A/WB12F	1/WB12F	150	55.7	0.81
1/WB12F	1A/WB12F	150	55.7	0.46
1A/WB12F	6/WB12	150	47.8	0.83
6/WB12	5/WB12	150	49.0	0.7
5/WB12	4/WB12	225	41.0	0.67
4/WB12	3/WB12	225	46.8	0.7
3/WB12	2/WB12	225	51.7	0.7
2/WB12	1/WB12	225	49.0	0.68
1/WB12	0/WB12	225	47.9	0.72
0/WB12	P/S WB12	225	44.8	0.99

Advice conditions:

- At no time does the supplying of theoretical data from the Townsville City Council hydraulic network model/s lessen the applicant's responsibility for the quality and integrity of their analysis.
- Townsville City Council cannot guarantee water pressures and flows in excess of itspublished service standards.
- The information provided is based on the best available information at the time of publication and is subject to variation over time.
- Network models are verified with limited data and conditions in the field may vary from modelling assumptions.
- Field investigations and inspections should be undertaken to satisfy the user that the data is suitable for its intended purpose.
- Tests should also be undertaken during peak demand periods to verify existing conditions within the network.
- Users relying on hydraulic modelling information do so at their own risk.

Hydraulic designers shall also note:

- Pressure in the network can fluctuate due to a large number of factors:
  - Normal daily variations due to time of day water use patterns, tank water level fluctuations, hydraulic transients, valve operation, and cycling of pumps.
  - Short-term emergencies due to fires, pipe breaks, system components out of service for rehabilitation and repair, power outages, and flows from sprinklers to fight fires.
  - Long-term system changes due to water main construction, changes in pressure regulating valve settings, addition of new pumps, corrosion and scale in piping, and changes in pressure zone boundaries.
  - Long-term variations in water use patterns, including new users and changes in usage for existing users.