



# Wastewater Network Extrinsic Material Report

May 2022

# CONTENTS

|            |   |          |
|------------|---|----------|
| <b>1.0</b> | <b>BACKGROUND</b> .....   | <b>2</b> |
| 1.1        | PURPOSE OF REPORT .....   | 2        |
| <b>2.0</b> | <b>PLANNING ASSUMPTIONS</b> .....   | <b>2</b> |
| 2.1        | DEVELOPMENT PROJECTIONS.....  | 2        |
| 2.2        | DEMAND ASSUMPTIONS .....  | 2        |
|            | <i>Table 1 Demand generation rates used to calculate wastewater demand (EP).....</i>          | <i>3</i> |
|            | <i>Table 2 Existing and projected demand (EP) for each wastewater service catchment .....</i> | <i>4</i> |
| <b>3.0</b> | <b>DESIRED STANDARD OF SERVICE</b> .....  | <b>4</b> |
|            | <i>Table 3 Wastewater desired standards of service .....</i>                                  | <i>4</i> |
| <b>4.0</b> | <b>WASTEWATER NETWORK PLANNING</b> .....  | <b>5</b> |
|            | <i>Table 4 Trunk wastewater infrastructure types.....</i>                                     | <i>5</i> |
| <b>5.0</b> | <b>INFRASTRUCTURE COSTS</b> .....   | <b>6</b> |
| 5.1        | COST OF LAND .....  | 6        |
| 5.2        | COST OF WORKS .....   | 6        |
| 5.3        | ON-COST ALLOWANCE .....   | 6        |
| 5.4        | CONTINGENCY ALLOWANCE .....   | 6        |
|            | <i>Table 5 Contingency allowance .....</i>  | <i>7</i> |
| <b>6.0</b> | <b>WASTEWATER NETWORK SCHEDULE OF WORKS</b> .....   | <b>7</b> |
|            | <i>Table 6 Future trunk wastewater infrastructure included in LGIP .....</i>                  | <i>7</i> |
| <b>7.0</b> | <b>AUTHORISATION</b> .....  | <b>9</b> |

## 1.0 Background

Toowoomba Regional Council (TRC) has prepared a Local Government Infrastructure Plan (LGIP) in accordance with the *Planning Act 2016* and associated rules. The LGIP identifies the type, scale, location and timing of development within the local government area for the period 2021-2031. It also identifies trunk infrastructure to service that growth at the desired standard of service.

The following trunk infrastructure networks are included within the LGIP:

- (a) Water supply network
- (b) Wastewater network
- (c) Transport network
- (d) Stormwater quantity network
- (e) Parks network.

TRC's LGIP is Part 4 and Schedule 3 of the Toowoomba Regional Planning Scheme (version 27.0).

### 1.1 Purpose of report

This extrinsic material report has been prepared to assist in the interpretation of TRC's LGIP. The report summarises the inputs and methodology used to prepare the parks network component of the LGIP and references all background studies and reports relevant to its preparation.

## 2.0 Planning assumptions

### 2.1 Development projections

Projections of dwellings and non-residential GFA provide a basis for the planning of wastewater network infrastructure within each planning catchment.

Development projections for the Toowoomba local government area were undertaken in 2015, and are documented in the report titled "Toowoomba Regional Council Demographic Projections". The development These projections are summarised in the Development Projections Extrinsic Material report dated April 2016.

### 2.2 Demand assumptions

Demand in the wastewater network is expressed in equivalent persons (EP) which represents an average daily wastewater load (litres per day).

The number of EPs within each planning catchment at ultimate development was calculated using zone and precinct based demand generation rates.

The demand generation rates were calculated by Water Project Services for each zone and precinct within a planning catchment using water consumption data from existing development within the relevant zones and precincts. The demand generation rates for each zone and precinct for each planning catchment are shown in Table 1.

For the purpose of LGIP reporting, these planning catchments have been aggregated into a number of service catchments identified in column 2 of Table 1.

**Table 1 Demand generation rates used to calculate wastewater demand (EP)**

| Planning Catchment  | Service Catchment       | Zone / Precinct  | Demand generation rate (EP/ha) |
|---|-------------------------|--|--------------------------------|
| Pittsworth, Brookstead and Southbrook   | Pittsworth              | Low-Medium Density Residential   | 39                             |
|   |                         | Commercial   | 36                             |
|   |                         | Low Impact Industry  | 20                             |
|   |                         | Medium Impact Industry   | 30                             |
| East Creek  | Toowoomba (bulk sewage) | Low-Medium Density Residential General   | 39                             |
| Greater Drayton and Glenvale, (Harristown, Rangeville, Kearneys Spring, Drayton, Glenvale, Middle Ridge and Darling Heights)  | Toowoomba (bulk sewage) | Low-Medium Density Residential General   | 37.5                           |
|   |                         | Low-Medium Density Residential Urban   | 42.5                           |
|   |                         | Low Impact Industry  | 15                             |
|   |                         | Medium Impact Industry   | 30                             |
| Western Toowoomba, Westbrook and Charlton Wellcamp Enterprise Area (CWEA), Mount Kynoch, Cotswold Hills, Torrington, Wilsonton, Rockville, Harlaxton, Newton, Toowoomba City, Glenvale, Harristown and Westbrook) | Toowoomba (bulk sewage) | Residential Living   | 39                             |
|   |                         | Residential Choice - Urban Residential   | 104                            |
|   |                         | Residential Choice - Urban Consolidation   | 108-144                        |
|   |                         | Emerging Communities   | 39                             |
|   |                         | Low Impact Industry  | 15                             |
|   |                         | Medium Impact Industry   | 30                             |
| Highfields, Gowrie Junction, Kingsthorpe, Greater Glenvale Wastewater Catchment (Glenvale, Harristown and South Toowoomba)  | Toowoomba (bulk sewage) | Township -Residential (assumed Low Density & Low-Medium Density Regional Residential Precinct) | 39                             |
|   |                         | Township – Commercial  | 42                             |
|   |                         | Industrial   | 30                             |
| Yarraman  | Yarraman                | Low-Medium Density Regional Residential  | 37.5                           |
| Oakey   | Toowoomba (bulk sewage) | Residential Choice – Regional Residential  | 39                             |
| Cambooya  | Cambooya                | Low-Medium Density Residential   | 45                             |
| Crows Nest  | Crows Nest              | Low-Medium Density Residential   | 35                             |
| Meringandan West  | Toowoomba (bulk sewage) | Township -Residential (assumed Low Density & Low-Medium Density Regional Residential Precinct) | 39                             |
| Wyreema   | Toowoomba (bulk sewage) | Low-Medium Density Residential   | 45                             |

The demand (EP) at the base date was calculated using existing water consumption and return to sewer data. Growth in demand at each intermediate growth horizon was determined using historical growth rates. A summary of total demand for each wastewater service catchment is provided in in Table 2.

**Table 2 Existing and projected demand (EP) for each wastewater service catchment**

| Service catchment       | Existing and projected demand (EP) |         |         |                      |
|-------------------------|------------------------------------|---------|---------|----------------------|
|                         | 2021                               | 2026    | 2031    | Ultimate development |
| Cambooya                | 1,684                              | 1,915   | 2,146   | 2,422                |
| Crows Nest              | 2,470                              | 2,667   | 2,883   | 3,778                |
| Pittsworth              | 3,580                              | 3,703   | 3,827   | 4,531                |
| Toowoomba (bulk sewage) | 168,741                            | 211,378 | 233,915 | 354,220              |
| Yarraman                | 1,020                              | 1,058   | 1,098   | 1,284                |

### 3.0 Desired Standard of Service

Planning of the wastewater network required the DSS to be applied to the forecast demand (EP) in each service catchment. The complete desired standards of service for the wastewater network are stated in PSP No. 3 – Engineering Standards – Water and Wastewater Infrastructure and TRC Policy 2.40 - Pressure Sewerage Policy.

The key desired standards of service used to plan the sewer network are summarised in Table 3. These are the planning standards from which past studies have been undertaken and are not to be used for future planning.

Unit wastewater flow should be specified as equivalent person (EP). EP is defined as sewage discharge for a person resident in a detached house. An equivalent tenement (ET) is defined as a detached house.

**Table 3 Wastewater desired standards of service**

| Parameter  | Standard for LGIP  |
|--|--|
| Average dry weather flow (ADWF) per EP, for wastewater network | In the absence of location / study specific data, the following ADWF value is used: <ul style="list-style-type: none"> <li>150 L/EP/d (75 % of 200 L/EP/d) for conventional gravity sewer systems in residential areas</li> <li>180 L/EP/d for industrial / commercial areas.</li> </ul> |
| Peak wet weather flow (PWWF)                                   | 5 x ADWF   |
| Maximum depth of flow at PWWF for gravity sewers               | 0.75 x diameter  |
| Minimum rising main velocity                                   | 0.75 m/s   |
| Maximum rising main velocity                                   | 1.5 m/s (single pump)<br>2.5 m/s (all pumps)   |

Determination of planning parameters should be based on methodology identified by Department of Energy and Water Supply, Planning Guidelines for Water Supply and Sewerage.

Derivation of EPs should be based on Residential EPs being derived from location specific tenement occupancy ratios. Where this information is unavailable, adopt an EP/ET ratio as provided on the Australian Bureau of Statistics website.

Non Residential EPs being derived from metered water consumption information and adopted EP rates. Where this is unavailable, Guideline unit rates (e.g. DEWS, WSAA) may be used, upon agreement with Council.

## 4.0 Wastewater network planning

The types of infrastructure listed in Table 4 may be considered to be trunk wastewater infrastructure for the purpose of LGIP planning.

**Table 4 Trunk wastewater infrastructure types**

| Trunk wastewater infrastructure types |
|---------------------------------------|
| Gravity main                          |
| Pressure main                         |
| Pump station                          |
| Water reclamation facility            |
| Treatment facility                    |

Trunk wastewater infrastructure may also include land where this is an integral part of a project.

Planning undertaken for the area to be serviced with a wastewater network is documented in the following reports:

- [Highfields and Meringandan Sewerage Catchment Study Planning Report prepared by Toowoomba Regional Council in April 2021;](#)
- [North Toowoomba Sewerage Catchment Study Planning Report by Toowoomba Regional Council in October 2020;](#)
- [East Creek Sewerage Catchment Study Planning Report prepared by Toowoomba Regional Council in November 2019;](#)
- *Kingsthorpe Sewerage Catchment Study* prepared by Toowoomba Regional Council in April 2019.
- *Gowrie Junction Sewerage Catchment Study* prepared by Toowoomba Regional Council in October 2018.
- [Greater Glenvale Sewerage Catchment Study Planning Report prepared by Toowoomba Regional Council in November 2017;](#)
- [Greater Drayton Sewerage Catchment Study Planning Report prepared by Toowoomba Regional Council in February 2017;](#)
- *Yarraman Sewerage Study Planning Report* prepared by Toowoomba Regional Council in April 2016.
- [Oakey Sewerage Study Planning Report prepared by Toowoomba Regional Council in May 2015;](#)
- [Greater Western Toowoomba Sewerage Strategy Study prepared by Toowoomba Regional Council in May 2015;](#)
- *Cambooya Sewerage Study Planning Report* prepared by Toowoomba Regional Council in July 2014.
- [Westbrook Sewerage Study Planning Report prepared by Toowoomba Regional Council in June 2014;](#)
- *Wyreema Sewerage Study Planning Report* prepared by Toowoomba Regional Council in June 2014.

- [Crows Nest Sewerage Catchment Study Planning Report prepared by Toowoomba Regional Council in September 2013;](#)
- *Wetalla Loading Review Investigation Report* prepared by Toowoomba Regional Council in September 2012; and
- *Toowoomba Sewerage Catchments Study* prepared by Toowoomba Regional Council in February 2008.

## 5.0 Infrastructure costs

The PA defines establishment cost of trunk infrastructure to be-

- (a) *For existing infrastructure –*
  - i. *The current replacement cost of the infrastructure as reflected in the relevant local government asset register; and*
  - ii. *The current value of the land acquired for the infrastructure*
- (b) *For future infrastructure – all the costs of land acquisition, financing, and design and construction, for the infrastructure*

The establishment cost of trunk wastewater infrastructure has been calculated as follows.

### 5.1 Cost of land

The establishment cost of existing land used for trunk wastewater infrastructure was obtained from TRC's asset register as at June 2015.

Where land is required for future trunk wastewater infrastructure, the establishment cost is derived from an assessment provided by Council's Property Services Team.

### 5.2 Cost of works

The establishment cost of existing trunk wastewater infrastructure (works) was obtained from TRC's asset register as at June 2015.

The establishment cost of future trunk wastewater infrastructure (works) was calculated using a combination of unit rates, first principles estimates and contract prices where available.

The unit rates used to calculate the establishment cost of trunk wastewater infrastructure are documented in the report titled *Water and Sewerage Infrastructure Unit Rates Review* prepared in October 2020 and updated yearly via indexation.

Using these unit rates, the establishment cost of future trunk wastewater infrastructure was calculated and then indexed to June 2021 dollars based on analysis of a combination of the Producer Price Index, and Implicit Price Deflator.

### 5.3 On-cost allowance

On-costs represent the owner's project costs and may include master planning, survey, geotechnical investigations, design, project management, contract administration and environmental investigations. An on-cost allowance of 15% has been applied to future projects within the wastewater network.

### 5.4 Contingency allowance

A contingency allowance is included in the establishment cost of future trunk infrastructure to deal with known risks. The contingency allowance typically reduces in accordance with the level of planning

undertaken for the infrastructure item. The level of contingency allowance applied to future projects within the wastewater network are stated in Table 5.

Table 5 Contingency allowance

| Project phase     | Contingency allowance |
|-------------------|-----------------------|
| Master planning   | 25%                   |
| Detailed planning | 15%                   |
| Detailed design   | 10%                   |

## 6.0 Wastewater network schedule of works

Table 6 provides a list of trunk infrastructure planned for the wastewater network and included in the LGIP.

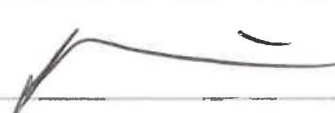

Table 6 Future trunk wastewater infrastructure included in LGIP

| Map reference | Trunk infrastructure  | Estimated timing | Establishment cost <sup>1</sup> |
|---------------|---|------------------|---------------------------------|
| GM10027       | Gravity Sewer (DN450) New (Crocker Rd), Westbrook                   | 2023-2024        | \$814,000                       |
| GS10054       | Gravity Sewer (DN300) New (Nass Rd), Charlton                       | 2026-2027        | \$143,000                       |
| GS10060       | Gravity Sewer (DN225) New (Hursley Rd), West Toowoomba              | 2030-2031        | \$387,000                       |
| GS10061       | Gravity Sewer (DN300) New (Robson-Hursley Rd), West Toowoomba       | 2030-2031        | \$442,000                       |
| GS10065       | Gravity Sewer (DN225) from existing SPS New (Luck St), Drayton      | 2022-2024        | \$634,000                       |
| GS10066       | Gravity Sewer (DN225) New (Tristania St), Drayton                   | 2025-2026        | \$432,000                       |
| GS10068       | Gravity Sewer (DN450) New (West Creek), Drayton                     | 2026-2027        | \$143,000                       |
| GS10070       | Gravity Sewer (DN225) New (West St), Drayton                        | 2025-2026        | \$331,000                       |
| GS10071       | Gravity Sewer (DN300) New (Nelson St), Drayton                      | 2025-2026        | \$308,000                       |
| GS10076       | Gravity Sewer (DN225) New (Bridge St), East Creek                   | 2022             | \$222,000                       |
| GS10080       | Gravity Sewer (DN225) Upgrade (Boundary St- PS61), North Toowoomba  | 2022             | \$31,000                        |
| GS10084       | Gravity Sewer (DN300) Upgrade (Boundary St - PS10), North Toowoomba | 2025-2026        | \$28,000                        |
| GS10082       | Gravity Sewer (DN375) Upgrade (Black Gully), North Toowoomba        | 2024-2026        | \$242,000                       |
| GS10083       | Gravity Sewer (DN300) Upgrade (Tor St), North Toowoomba             | 2024-2026        | \$338,000                       |
| GS10086       | Gravity Sewer (DN225) New (Kuhls Rd), Highfields - Section 1        | 2023-2024        | \$77,000                        |
| GS10097       | Gravity Sewer (DN300) New (Kuhls Rd), Highfields - Section 2        | 2023-2024        | \$36,000                        |
| GS10087       | Gravity Sewer (DN225) New (Highfields Rd), Meringandan - Section 1  | 2023-2024        | \$621,000                       |
| GS10098       | Gravity Sewer (DN300) New (Highfields Rd), Meringandan - Section 2  | 2023-2024        | \$51,000                        |
| GS10038       | Gravity Sewer (DN750) New (Ganzer Rd), Torrington                   | 2022-2023        | \$172,000                       |

| Map reference | Trunk infrastructure  | Estimated timing | Establishment cost <sup>1</sup> |
|---------------|---|------------------|---------------------------------|
| GS10041       | Gravity Sewer (DN225) New (Armstrong St), West Toowoomba                | 2022             | \$85,000                        |
| GS10042       | Gravity Sewer (DN375) New (Carrington Rd), Torrington                   | 2022             | \$2,332,000                     |
| GS10046       | Gravity Sewer (DN375) New (Steger Rd), Charlton                         | 2025-2026        | \$1,304,000                     |
| GS10047       | Gravity Sewer (DN450) New (Troys Rd), Glenvale                          | 2030-2031        | \$1,480,000                     |
| GS53          | Gravity Sewer (DN900) Upgrade (Gowrie Creek), North Toowoomba           | 2022-2024        | \$5,812,000                     |
| GS10074       | Gravity Sewer (DN225) New (Spring Creek), Glenvale                      | 2023-2024        | \$517,000                       |
| GS10072       | Gravity Sewer (DN225) New (Glenvale Rd), Glenvale - Section1            | 2025-2026        | \$213,000                       |
| GS10073       | Gravity Sewer (DN225) New (Glenvale Rd), Glenvale - Section2            | 2025-2026        | \$551,000                       |
| PM10004       | Rising Main (DN100) New (Gore Hwy), Westbrook                           | 2025-2026        | \$130,000                       |
| PM10009       | Rising Main (DN450) New (Western Railway), Gowrie Junction              | 2026-2027        | \$5,180,000                     |
| PM10014       | Rising Main (DN150) New (Robson-Hursley Rd), West Toowoomba             | 2030-2031        | \$160,000                       |
| PM10020       | Rising Main (DN225) New (Tristania St), Drayton                         | 2025-2026        | \$686,000                       |
| PM10023       | Rising Main (DN225) New (Spring Creek), Glenvale                        | 2023-2024        | \$377,000                       |
| PM10026       | Rising Main (DN150) New (Clarke Rd), Highfields                         | 2023-2024        | \$351,000                       |
| PM10027       | Rising Main (DN150) New (Highfields Rd), Meringandan - Section 3        | 2023-2024        | \$222,000                       |
| PM10016       | Rising Main (DN200) New (Drayton Wellcamp Rd), West Toowoomba           | 2030-2031        | \$675,000                       |
| PM10019       | Rising Main (DN250) from SPS02 New (Luck St), Drayton                   | 2023-2024        | \$331,000                       |
| SPS10006      | Sewerage Pumping Station (5kW) New (Gore Hwy), Westbrook                | 2025-2026        | \$340,000                       |
| SPS10017      | Sewerage Pump Station (375kW) Upgrade, Gowrie Junction                  | 2026-2027        | \$1,891,000                     |
| SPS10020      | Sewage Pumping Station (6kW) New (Dry Creek), West Charlton             | 2030             | \$704,000                       |
| SPS10021      | Sewage Pumping Station 2 (9kW) New (Hanrahan Rd), Charlton              | 2030             | \$615,000                       |
| SPS10022      | Sewage Pumping Station (22kW) New (Hursley Rd), West Toowoomba          | 2030-2031        | \$718,000                       |
| SPS10023      | Sewage Pumping Station 1 (15kW) New (Hanrahan Rd), Charlton             | 2030             | \$635,000                       |
| SPS10024      | Sewage Pumping Station (15kW) New (Drayton Wellcamp Rd), West Toowoomba | 2030-2031        | \$909,000                       |
| SPS10028      | Sewage Pumping Station (105k) New (Luck St), Drayton                    | 2022-2024        | \$1,511,000                     |
| SPS10036      | Sewage Pumping Station (22kW) New (Kuhls Rd), Highfields                | 2022-2023        | \$698,000                       |
| SPS10037      | Sewage Pumping Station (11kW) New (Highfields Rd), Meringandan          | 2022-2023        | \$564,000                       |
| SPS10038      | Sewage Pumping Station (11kW) New (Wirraglen Rd), Highfields            | 2030             | \$594,000                       |
| SPS10039      | Sewage Pumping Station (32kW) New (Woolmer Rd)                          | 2030             | \$675,000                       |
| SPS10029      | Sewage Pumping Station (47KW) New (Tristania St), Drayton               | 2025-2026        | \$1,129,000                     |

| Map reference | Trunk infrastructure   | Estimated timing | Establishment cost <sup>1</sup> |
|---------------|--|------------------|---------------------------------|
| SPS10032      | Sewage Pumping Station 56 (22kW) New (Boundary St), Glenvale | 2023-2024        | \$921,000                       |
| WRF4          | Water Reclamation Plant New, Crows Nest                      | 2022-2024        | \$6,000,000                     |
| <b>TOTAL</b>  |  |                  | <b>\$43,762,000</b>             |

## 7.0 Authorisation

| AUTHORISED                                |   |           |  |
|---|---|-----------|--|
| Name                                      | Position  | Date      | Signature  |
| <del>Ray Stephenson</del><br>Jack Passier | Manager Strategic Water Plan & Capital Delivery | 23/6/2022 |   |
| Damian Platts                             | General Manager Water & Waste Services          | 27/6/2022 |  |