# Greater Dublin Drainage

# Alternative Sites Assessment and Route Selection Report (Phase 4):
## Final Preferred Site and Routes

# Appendix 2
## Assessment of Load on Proposed Regional WwTP

**June 2013**

JACOBS TOBIN

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**C Loading Analysis on Wastewater Treatment Plants**

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# List of Acronyms

| | |
|---|---|
| ASA | Alternative Site Assessment |
| BOD | Biochemical Oxygen Demand |
| BRDS | Blanchardstown Regional Drainage Scheme |
| DoECLG | Department of Environment, Community and Local Government (formerly DEHLG) |
| DEHLG | Department of Environment, Heritage and Local Government (now DoECLG) |
| EPA | Environmental Protection Agency |
| ERBD | Eastern River Basin District |
| GCTS | Grand Canal Tunnel Sewer |
| GDA | Greater Dublin Area |
| GDD | Greater Dublin Drainage |
| GDSDS | Greater Dublin Strategic Drainage Study |
| IPPC | Integrated Pollution Prevention & Control |
| KDA | Key Development Area |
| NDDS | North Dublin Drainage Scheme |
| NFS | North Fringe Sewer |
| P.E. | Population Equivalent |
| RPG | Regional Planning Guidelines |
| SEA | Strategic Environmental Assessment |
| WWDA | Wastewater Discharge Authorisation |
| WwTP | Wastewater Treatment Plant |

# 1 Introduction

## 1.1 Title

The official name of the project is *Greater Dublin Drainage – Regional Wastewater Treatment Plant, Marine Outfall & Orbital Drainage System.*

## 1.2 Client

The Client is Fingal County Council as the Contracting Authority on behalf of Meath, Kildare, Dun Laoghaire / Rathdown and South Dublin County Councils and Dublin City Council.

## 1.3 Project Engineering Consultant

Following a competitive tender process Jacobs Engineering Ireland Ltd. supported by TOBIN Consulting Engineers was appointed to act as Project Engineering Consultant on this project with formal signing of Contract on the 14th March 2011.

## 1.4 Project Communications Consultant

Following a competitive tender process RPS Project Communications was appointed by FCC to act as Project Communications Consultant on this project.

## 1.5 Previous Reference Studies

- Greater Dublin Strategic Drainage Study (GDSDS) completed in April 2005, and
- Strategic Environmental Assessment of the Greater Dublin Strategic Drainage Study (SEA of GDSDS).

## 1.6 Project Stages

The Project is divided into a number of stages as follows:

- Sub – Stage (a): Project Inception
- Sub – Stage (b): Alternative WwTP Site Assessment (ASA) / Pipeline and Marine Route Selection Report
- Sub – Stage (c): Preliminary Report (PR)
- Sub – Stage (d): Environmental Impact Statement (EIS)
- Sub – Stage (e): Wayleave / Land Acquisition
- Sub – Stage (f): Additional Reports

- Sub – Stage (g): Planning Stage
- Sub – Stage (h): Any Other Work

## 1.7 Objectives

The core requirement of the Greater Dublin Drainage project is to safely deliver through the entire planning process a:

- Regional Wastewater Treatment Plant (WwTP) and associated marine outfall located at a site, to be selected as part of this process, in the northern part of the Greater Dublin Area (GDA), and
- an Orbital Drainage System linking the Regional WwTP to the existing regional sewer network and to provide for future connections for identified developing areas within the catchment.

## 1.8 Commencement Date

The official commencement date of the project is set as the 14th March 2011.

# 2 Background

## 2.1 Introduction

The strategies proposed by the Greater Dublin Strategic Drainage Study (GDSDS) to meet the Greater Dublin Area (GDA) drainage infrastructural requirements, at the 2011 and 2031 design horizons adopted in that Study, were predicated on population projections based on the 2002 Census, with non domestic and trade effluent data built up from considerations of sub-catchment planning potential. The detailed Population and Land Use Study, undertaken as part of the GDSDS and reported on in March 2003, did not foresee the large inward migration that occurred, post 2004, following expansion of the EU. The economic landscape has also altered markedly since the Population and Land Use Study was undertaken, and in the last few years there has been a shift in migration trends, driven by the state of the Irish economy relative to other countries.

The December 2010 update of the Regional Planning Guidelines (RPG) for the GDA, and the release of the results from Census 2011 present an ideal opportunity to confirm existing population and non-domestic loads on the various wastewater treatment plants in the GDA. It also permits re-examination of population and non-domestic growth rates in the GDA, up to and beyond the redefined design year horizon of 2040 for the Greater Dublin Drainage project, with particular emphasis on the contributing catchment to Ringsend WwTP.

The aim of this report is to determine appropriate growth rates for residential population from a base year of 2011 to the design year horizon of 2040, to consider an appropriate allowance for existing and future commercial load, and to consider what appropriate allowance should be made for future industrial load in the study area. It also explores the appropriate, or likely, split of this industrial load between the Ringsend WwTP and the new Regional WwTP.

In analysing potential growth rates all projections have been extended to 2050 to allow consideration of potential requirements in this further 10 year period, post the agreed design year horizon of 2040.

## 2.2 Study Area

The study area for the GDD project is illustrated in **Fig.2.1**.

## 2.3 Contributing Catchment to Ringsend WwTP

The contributing catchment to Ringsend WwTP is illustrated in **Fig. 2.2**.

## 2.4 Potential Contributing Catchment to Regional WwTP

A key element of the preferred strategic drainage strategy arising from completion of the Strategic Environmental Assessment (SEA) of the Greater Dublin Strategic Drainage Study (GDSDS) was the diversion of wastewater from newly developed areas in the north, west and north-west of the Greater Dublin Area (including e.g. Lucan, Clondalkin, Blanchardstown, Mulhuddart, East Meath and Kildare) to the new Regional WwTP.

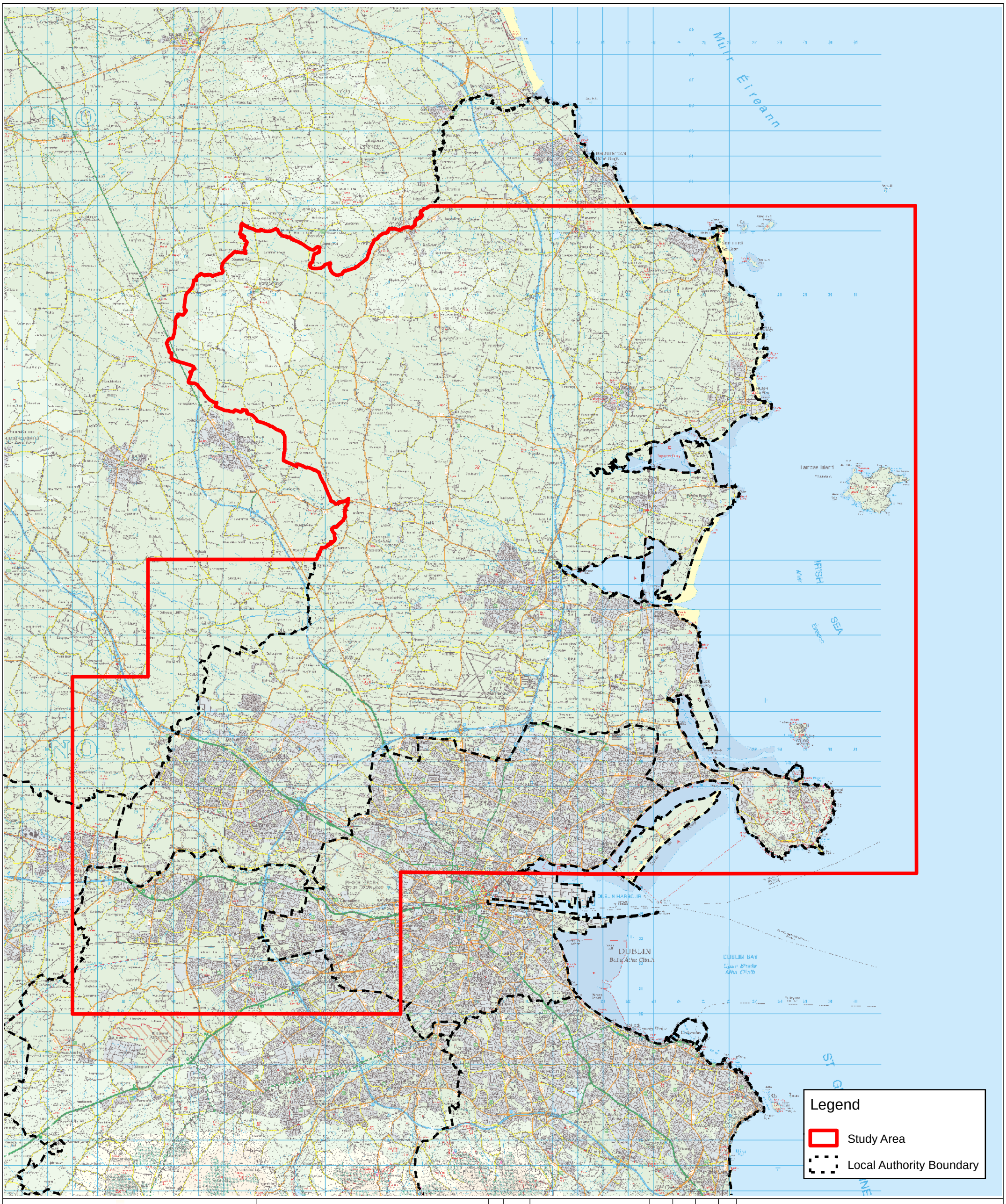
The critical drainage catchments in the GDA, which have an influence on the required treatment capacities of both the upgraded Ringsend WwTP and the proposed Regional WwTP are indicated in **Figs. 2.3 – 2.5** and comprise;

- The existing catchment and future residual catchment of Ringsend WwTP
- The Blanchardstown (Route 9C Sewer) sub-catchment of Ringsend WwTP (includes the Meath towns & villages of Ashbourne, Ratoath, Kilbride, Dunboyne & Clonee)
- The North Dublin (North Fringe Sewer & North Dublin Drainage Scheme {NDDS} Sewer) sub-catchment of Ringsend WwTP
- The South Dublin – Lucan/Clondalkin (Route 9B Sewer) sub-catchment of Ringsend WwTP

The diversion of wastewater flows from these drainage sub-catchments will provide capacity at the expanded Ringsend WwTP for continued growth and development in the other Ringsend sub-catchments of Dublin City Centre, Dun Laoghaire Rathdown and South Dublin.

Additional catchments in the GDA, which may also influence future required treatment capacity of the new Regional WwTP, through diversion of flows & load in excess of ultimate treatment capability of the individual wastewater treatment plants in these catchments, are indicated in **Fig 2.6** and comprise;

- Swords WwTP Catchment
- Malahide WwTP Catchment
- Lower Liffey Valley (Leixlip WwTP) Catchment (Includes Leixlip, Celbridge, Maynooth, Kilcock and Straffan)
- Upper Liffey Valley (Osberstown WwTP) Catchment (Includes Naas, Prosperous, Clane, Sallins, Kill, Johnstown, Newbridge, Athgarvan and Kilcullen)




Greater Dublin Drainage

Drawing Title

GREATER DUBLIN DRAINAGE
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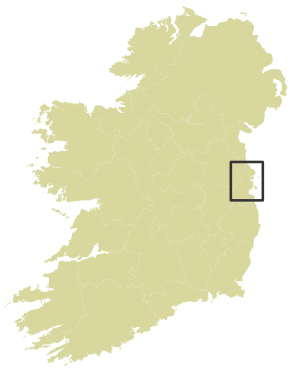

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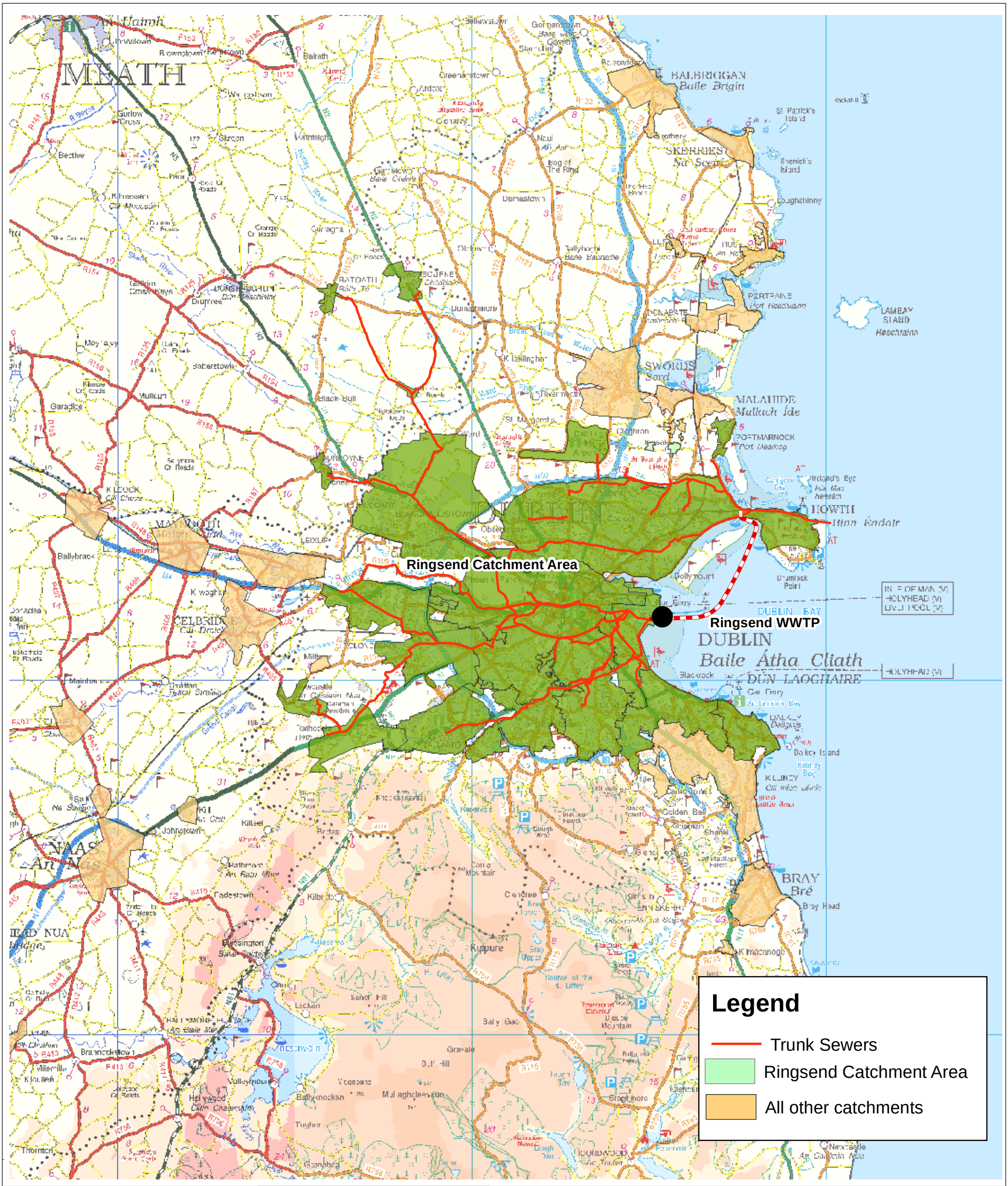


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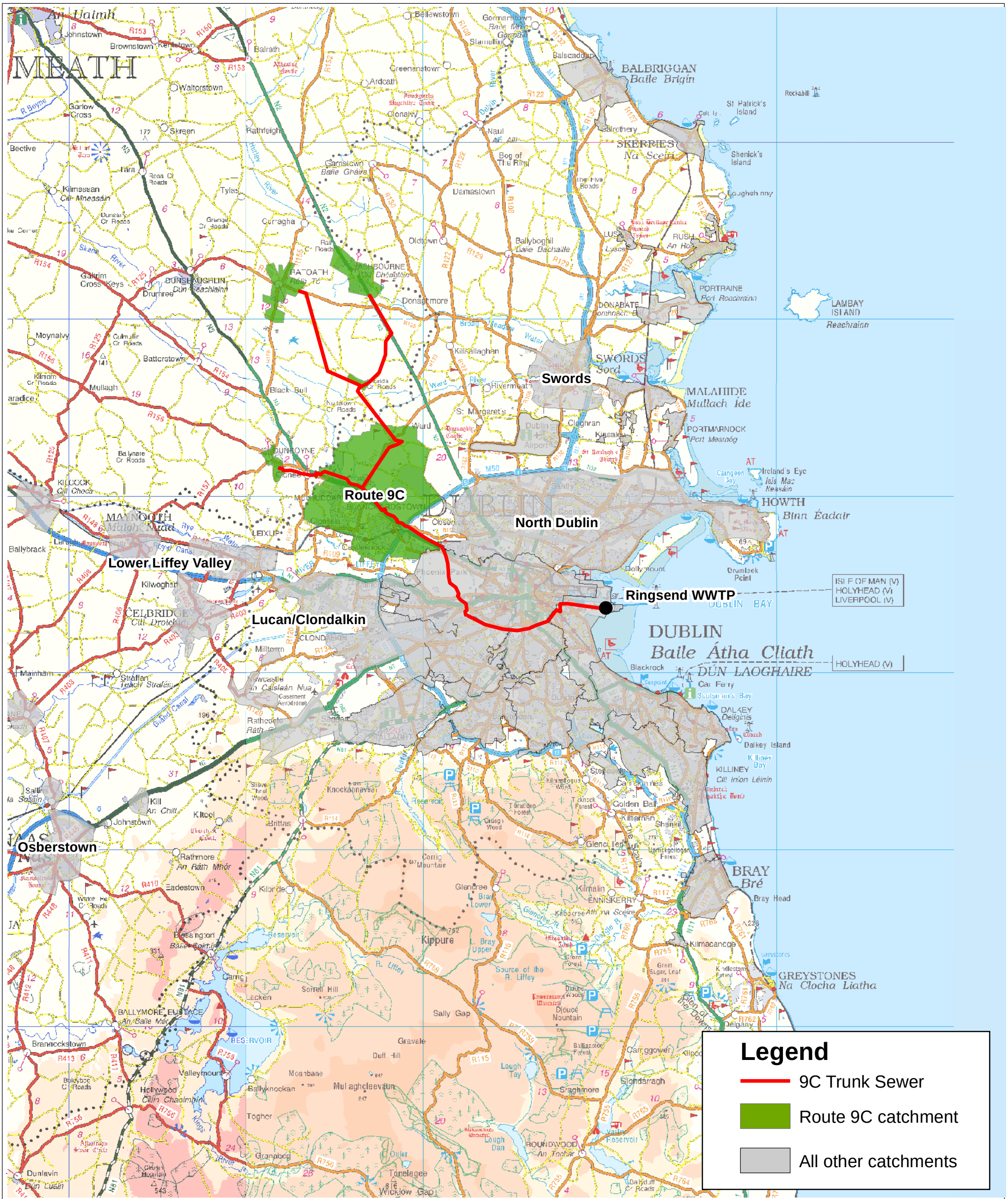


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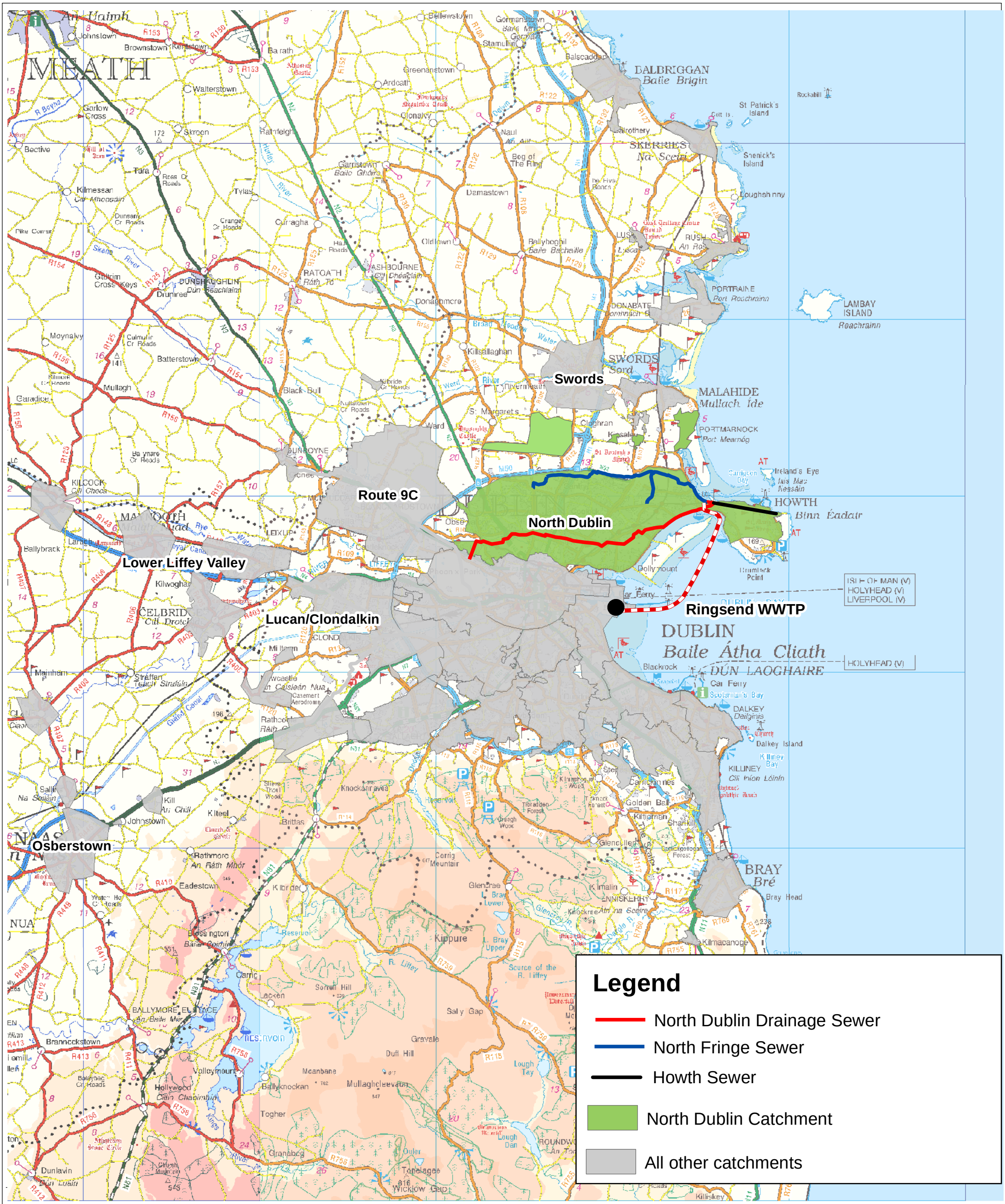


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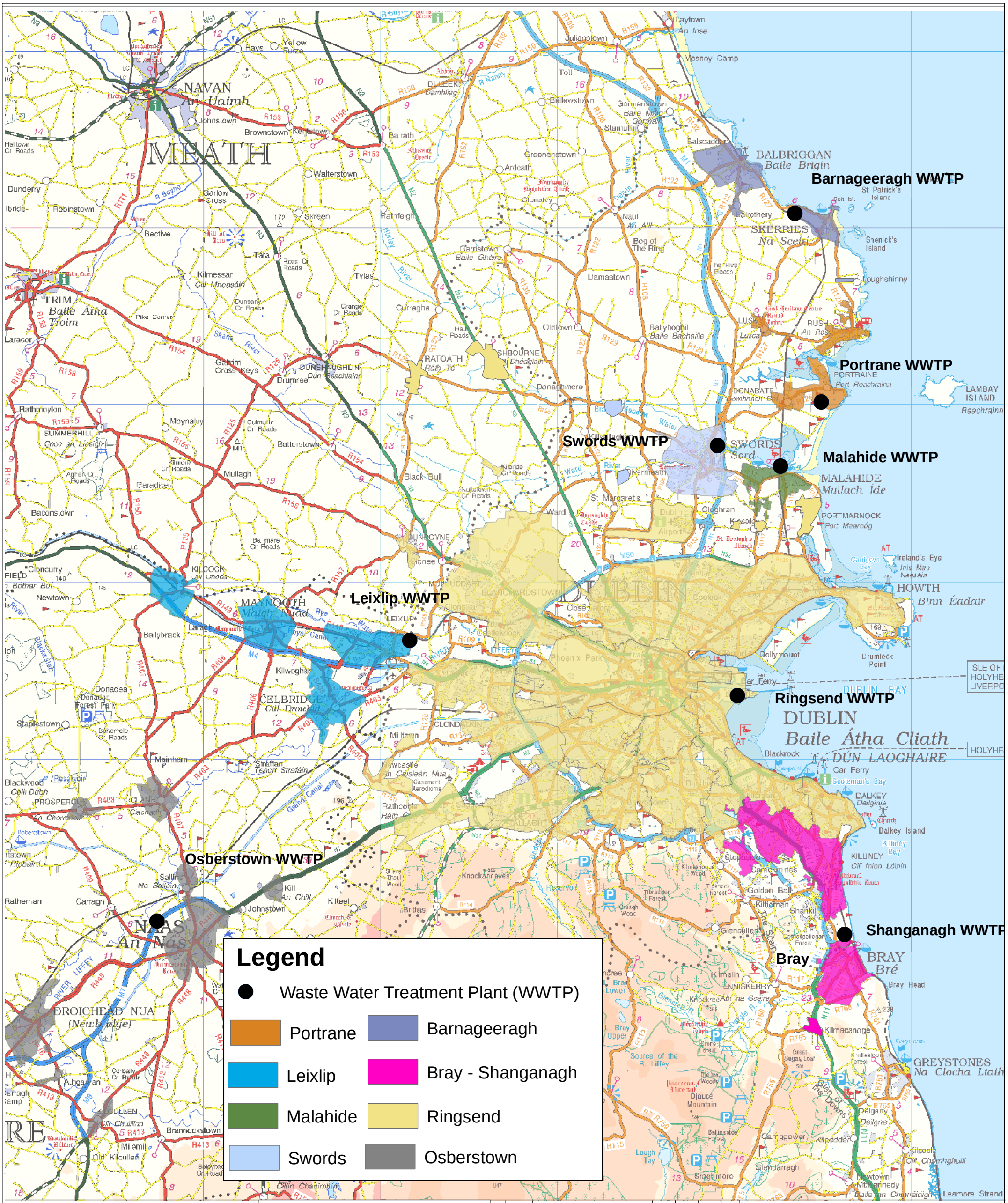


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# 3 Domestic and Non-Domestic Growth Rates

## 3.1 Existing and Future Residential Population

A detailed discussion on existing and potential future residential population is included in Appendix A. A summary of these discussions is presented in the sections hereunder.

### 3.1.1 Existing Residential Population

The existing residential population in the study area is provided by the results of Census 2011, as published on 26th April 2012.

The residential population contributing to the Ringsend WwTP in 2011 is estimated at 1,098,470 persons.

### 3.1.2 Future Residential Population

Population growth rates over the last twenty years have shown wide variation across the Greater Dublin Area (GDA). In consideration of this variability and with reference to the projections in the Regional Planning Guidelines (RPG) for the Greater Dublin Area, 2010 – 2022 and also to historical population trends within the GDA three future population growth scenarios with respect to the Greater Dublin Drainage project are proposed as outlined in Table 3.1.

**Table 3.1 Proposed Residential Population Growth Scenarios**

| Growth Scenario | Time Period | Annual Average Growth Rate |
|---|---|---|
| Nr 1. | 2011 - 2050 | Adopt the annual average growth rates derived from the 2010 - 2016 target population figures as set out in the RPG for the GDA 2010 – 2022. |
| Nr. 2 | 2011 - 2016 | Adopt the annual average growth rates derived from the 2016 target population figures as set out in the RPG for the GDA 2010 – 2022. |
| | 2016 - 2022 | Adopt the annual average growth rates derived from the 2016 - 2022 target population figures as set out in the RPG for the GDA, 2010 – 2022. |
| | 2022 - 2050 | Adopt the annual growth rate derived from the 50 year (1961 – 2011) historical Dublin County & County Borough (Dublin Region) growth rate |
| Nr 3 | 2011 - 2016 | Adopt the annual average growth rates derived from the 2016 target population figures as set out in the RPG for the GDA, 2010 – 2022. |
| | 2016 - 2050 | Adopt the annual growth rate derived from the 100 year (1901 – 2011) historical Dublin County & County Borough (Dublin Region) growth rate |

Target annual growth rates, derived from the RPG target figures for 2016 and 2022 have been examined for the individual local authorities at county level, at metropolitan & hinterland area level as defined by the RPG, and at drainage sub-catchment level. These annual growth rates have been sense checked against the potential capacity of residential and mixed-use land zonings to accommodate these annual growth rates, as per current County Development Plans.

Table 3.2 summarises the population growth rates adopted in this document.

**Table 3.2 Proposed Residential Population Growth Rates (percentages)**

| Catchment Area | 2011 - 2016 | 2016 - 2022 Growth Scenario | | | Post 2022 Growth Scenario | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 1 | 2 | 3 |
| Ringsend WwTP | 1.38 | 1.38 | 1.22 | 1.00 | 1.38 | 1.15 | 1.00 |
| Route 9C Sewer | | | | | | | |
| Blanchardstown | 1.79 | 1.79 | 1.27 | 1.00 | 1.79 | 1.15 | 1.00 |
| Ashbourne / Ratoath | 1.76 | 1.76 | 1.07 | 1.00 | 1.76 | 1.00 | 1.00 |
| Dunboyne / Clonee | 3.47 | 3.47 | 2.66 | 1.00 | 3.47 | 1.15 | 1.00 |
| North Fringe Sewer | | | | | | | |
| Fingal 'South Fringe' | 1.79 | 1.79 | 1.27 | 1.00 | 1.79 | 1.15 | 1.00 |
| Dublin North City | 1.08 | 1.22 | 1.22 | 1.00 | 1.22 | 1.15 | 1.00 |
| NDDS Sewer | | | | | | | |
| Dublin North City | 0.41 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fingal - Howth/Sutton | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Swords WwTP | 1.79 | 1.79 | 1.27 | 1.00 | 1.79 | 1.15 | 1.00 |
| Malahide WwTP | 1.79 | 1.79 | 1.27 | 1.00 | 1.79 | 1.15 | 1.00 |
| Leixlip WwTP | 2.64 | 2.64 | 1.83 | 1.00 | 2.64 | 1.15 | 1.00 |
| Osberstown WwTP | 2.20 | 2.20 | 1.15 | 1.00 | 2.20 | 1.15 | 1.00 |
| Route 9B Sewer | 1.41 | 1.41 | 1.16 | 1.00 | 1.41 | 1.15 | 1.00 |

## 3.2 Existing and Future Commercial, Institutional & Industrial Load

A detailed discussion on existing and potential future commercial, institutional and industrial load is included in Appendix B. A summary of these discussions is presented in the sections hereunder.

### 3.2.1 Commercial & Institutional Load

The load contribution from commercial and institutional sources is difficult to accurately assess due to the lack of legislation in place to provide complete monitoring and licensing of this sector.

The load contribution from commercial and institutional sources in the Ringsend WwTP catchment have been estimated by deducting known residential and industrial contributions from the total load measured at the treatment plant. In this manner the commercial and institutional load contribution to Ringsend WwTP in 2011 has been estimated at 420,660 PE or c.38% of residential contribution.

For other wastewater catchments in the Greater Dublin Area, where accurate information was not available the commercial and institutional contribution to treatment plant loading has been estimated using the following relationship

- Commercial loading = 16% of domestic/residential loading

This relationship has been used extensively in the estimation of flow and load for design purposes and is widely accepted at a local and national level in Ireland (source: National Urban Waste Water Study, DEHLG, vol 2, part A, section 5, 2004).

Future commercial load will be grown at the same growth rate as that used for the residential population as per Table 3.2.

### 3.2.2 Industrial Load

Industrial discharges are licensed under either the Integrated Pollution Prevention Control (IPPC) Licence with the EPA as the competent authority or a Waste Licence (Section 16) issued by the Local Authority.

Future industrial load requirements have been examined for each of the individual WwTP catchments.

**Ringsend WwTP Catchment**

The actual utilised industrial load discharging to the Ringsend WwTP catchment was measured in 2008 at 220,870 PE. The 2011 industrial load has been assumed to be the same as the 2008 measured load.

Future industrial PE load in the Ringsend catchment, which will ultimately be divided between the Ringsend WwTP and the new Regional WwTP, is outlined in Table 3.3:

**Table 3.3 Proposed Industrial Load Growth Rates – Ringsend Catchment**

| Growth Scenario | Description |
|---|---|
| Nr 1 | 220,870 PE existing load at year 2011<br>400,000 PE allowance at year 2025 (c.4.3% growth rate per annum 2011 to 2025)<br>500,000 PE allowance at year 2040 (c.1.5% growth rate per annum 2025 to 2040)<br>575,000 PE allowance at year 2050 (c.1.5% growth rate per annum 2040 to 2050) |
| Nr 2 | Maintain industrial load at same percentage of total load to 2050 |
| Nr 3 | Industrial load to grow at 0.7% per annum |

### Swords WwTP Catchment

The actual utilised industrial PE discharging to the Swords WwTP catchment is estimated as 3,000 PE in 2011.

The growth scenarios considered for future industrial PE discharges to Swords WwTP are based on applying an annual growth rate to the actual utilised existing industrial discharges up to a maximum of 25,000 PE as outlined in Table 3.4.

**Table 3.4 Proposed Industrial Load Growth Rates – Swords Catchment**

| Growth Scenario | Description |
|---|---|
| Nr 1 | 3,000 PE existing load at year 2011<br>25,000 PE allowance at year 2050 (c.5.6% growth rate per annum 2011 to 2050) |
| Nr 2 | 3,000 PE existing load at year 2011<br>15,000 PE allowance at year 2050 (c.4.2% growth rate per annum 2011 to 2050) |
| Nr 3 | 3,000 PE existing load at year 2011<br>7,500 PE allowance at year 2050 (c.2.4% growth rate per annum 2011 to 2050) |

### Malahide WwTP Catchment

Licenced industrial loading to the sewer network in Malahide is neglible and for the purposes of this report it has been counted as part of the estimated commercial and institutional load in Malahide.

### Lower Liffey Valley (Leixlip WwTP) Catchment

The utilised industrial PE discharging to the Leixlip WwTP catchment is estimated as 22,500 PE in 2011.

The growth scenarios considered for future industrial PE discharges to Leixlip WwTP are based on the known requirements of an existing industrial entity to increase its existing reserve capacity at Leixlip WwTP from 1,350kg/day of BOD (equivalent to 22,500 PE) to 3,800kg/day of BOD (equivalent to 63,333 PE) with immediate effect and to 5,082kg/day of BOD (equivalent to 84,700 PE) in the short to medium term.

The growth scenarios also acknowledge a stated objective of Kildare County Council to reserve and allocate 30,000 PE of total capacity at the upgraded Leixlip WwTP to development that yields long term sustainable employment (objective WW 3 of the Kildare County Development Plan 2011 – 2017).

Proposed growth scenarios are outlined in Table 3.5.

**Table 3.5 Proposed Industrial Load Growth Rates – Leixlip WwTP Catchment**

| Growth Scenario | Description |
|---|---|
| Nr 1 | Apply the full increased (84,700 PE) load from the major industry from 2013 and KCC future reserve capacity (30,000 PE) requirement applied from year 2020 (Regional WwTP in operation |
| Nr 2 | Apply the full increased (84,700 PE) load from the major industry from 2013 and half of KCC future reserve capacity (15,000 PE) requirement applied from year 2020 (Regional WwTP in operation). |
| Nr 3 | Apply a reduced load of 63,333 PE from the major industry from 2012 with no allowance for other industry. |

### Upper Liffey Valley (Osberstown WwTP) Catchment

The utilised industrial PE discharging to the Osberstown WwTP catchment is estimated as 10,820 PE in 2011.

The growth scenarios considered for future industrial PE discharges to Osberstown WwTP are based on applying an annual growth rate to the actual utilised existing industrial discharges and also providing for a stated objective of Kildare County Council to reserve and allocate 20,000 PE of total capacity at the upgraded Osberstown WwTP to development that yields long term sustainable employment (objective WW 2 of the Kildare County Development Plan 2011 – 2017).

Proposed growth scenarios are outlined in Table 3.6.

**Table 3.6 Proposed Industrial Load Growth Rates – Osberstown WwTP Catchment**

| Growth Scenario | Description |
|---|---|
| Nr 1 | An annual growth rate of 1.50% applied to the 2010 actual utilised industrial PE. An additional 20,000 PE is also applied from year 2016 (upgraded Osberstown WwTP in operation) to satisfy KCC future reserve capacity requirement. |
| Nr 2 | An annual growth rate of 1.25% applied to the 2010 actual utilised industrial PE. In addition apply half (10,000 PE) of KCC's required future reserve capacity from year 2016 (upgraded Osberstown WwTP in operation) |
| Nr 3 | An annual growth rate of 1.00% applied to the 2010 actual utilised industrial PE with no allowance for future reserve capacity. |

### 3.2.3 Summary of Applied Growth Scenarios

Growth Scenario 1, through the combination of high residential population growth rates with maximum projected commercial and industrial loading, provides an optimistic projection of future loading on wastewater treatment plants in the study area.

Growth Scenario 2 provides for a modest growth scenario by combining median residential population growth rates with the median commercial load projection and median to low industrial load projections

Growth Scenario 3 is a more modest growth scenario still, combining low residential population growth rates with low commercial and industrial projected load.

These three scenarios have been used to provide estimates of future PE loading on the wastewater treatment plants in the study area at design years 2020, 2031 and 2040 as set out in Section 4 hereunder.

# 4 Projected Population Equivalent Loadings

## 4.1 Introduction

In this section the projected population equivalent, i.e. the combination of residential, commercial and industrial, loadings under the three growth scenarios are summarised. A detailed analysis of the projected population equivalent loadings is provided in Appendix C.

The growth scenarios are initially applied on the Ringsend WwTP catchment to enable estimates of future PE loadings up to year 2050 to be made, so that the requirement, both quantum and timing, for load diversion out of the Ringsend WwTP catchment can be determined in the context of the newly defined ceiling on treatment capacity at Ringsend WwTP. This ceiling on treatment capacity has been confirmed in the *Ringsend Wastewater Treatment Works Extension – Environmental Impact Statement, March 2012.*

The critical drainage sub-catchments of Ringsend WwTP, as noted in Section 2.4 above, are then examined under similar growth scenarios to determine the quantum of load that could be available for diversion, either in full or in part, to the proposed new Regional WwTP, thereby reducing the load to the Ringsend WwTP and extending the design year horizon for Ringsend WwTP beyond 2025.

Finally other foul drainage catchments in the GDA, again as noted in Section 2.4 above, are similarly examined to determine any requirements for load diversion from these catchments to the proposed Regional WwTP in the context of the maximum available treatment capacity at the WwTPs in those catchments.

## 4.2 Design Horizon

In defining the existing and future WwTP requirements of the study area, the following design years have been identified;

- 2011 - Base year
- 2020 - Year in which diversion capacity has been determined to be required and commissioned for the necessary loads that are required to be diverted from Ringsend WwTP.
- 2031 - GDSDS final design year horizon
- 2040 - Long-term design horizon for the proposed Regional WwTP.

It should be noted that in analysing potential growth rates all projections have been extended to 2050 to allow consideration of potential requirements in this further 10 year period, post the agreed design year horizon of 2040.

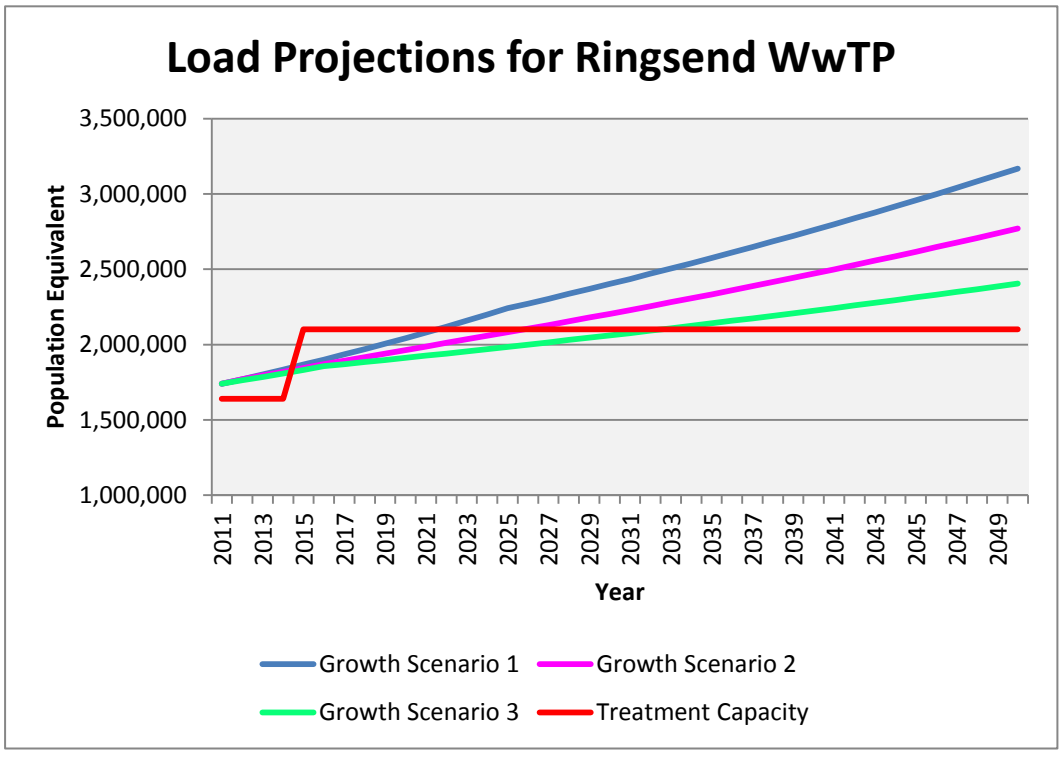
## 4.3 Ringsend WwTP Catchment

The projected population equivalent loadings for the Ringsend WwTP Catchment under the three growth scenarios examined are summarised in Table 4.1 and illustrated in Fig 4.1 below. The maximum operational treatment capacity at Ringsend WwTP of 2.1 million PE average daily load is also shown. The detailed analysis of projected loadings on Ringsend WwTP under all three growth scenarios is included in Appendix C.

**Table 4.1 Summary of Projected PE Loadings – Ringsend WwTP Catchment**

| Growth Scenario | Base Year | Design Year | | | Future Consideration |
|---|---|---|---|---|---|
| | 2011 | 2020 | 2031 | 2040 | 2050 |
| Scenario 1. | 1,740,000 | 2,042,106 | 2,435,585 | 2,760,535 | 3,167,592 |
| Scenario 2. | 1,740,000 | 1,962,919 | 2,229,093 | 2,470,706 | 2,770,001 |
| Scenario 3. | 1,740,000 | 1,911,635 | 2,076,987 | 2,225,523 | 2,405,967 |

**Fig. 4.1 Loading Projections for Ringsend WwTP.**




Under Growth Scenario 1 the maximum treatment capacity of 2.1 million PE is exceeded from year 2022.

Under Growth Scenario 2 the maximum treatment capacity of 2.1 million PE is exceeded from year 2026.

Under Growth Scenario 3 the maximum treatment capacity of 2.1 million PE is exceeded from year 2033

## 4.4 Route 9C Sewer Sub-Catchment

The projected population equivalent loadings in the Route 9C Sewer Sub-Catchment, under the three growth scenarios examined are summarised in Table 4.2. This represents the available projected load that could be diverted from this sub-catchment to the Regional WwTP. The detailed analysis of projected population equivalent loading in the Route 9C sewer catchment is included in Appendix C.

**Table 4.2 Summary of Projected PE Loadings – Route 9C Sewer Sub-Catchment**

| Growth Scenario | Design Year | | | | Future Consideration |
|---|---|---|---|---|---|
| | 2011 | 2020 | 2031 | 2040 | 2050 |
| Scenario 1. | 143,854 | 172,499 | 213,922 | 253,659 | 307,052 |
| Scenario 2. | 143,854 | 166,693 | 189,784 | 210,355 | 235,837 |
| Scenario 3. | 143,854 | 163,857 | 182,525 | 199,377 | 219,941 |

## 4.5 North Dublin Sub-Catchment

### North Fringe Sewer

The projected population equivalent loadings in the North Fringe Sewer Sub-Catchment under the three growth scenarios examined are summarised in Table 4.3. This represents the available projected load that could be diverted from this portion of the North Dublin sub-catchment to the Regional WwTP, by an interception of the North Fringe sewer only. The detailed analysis of projected population equivalent loading in the North Fringe Sewer catchment is included in Appendix C

**Table 4.3 Summary of Projected PE Loadings – North Fringe Sewer Catchment**

| Growth Scenario | Design Year | | | | Future Consideration |
|---|---|---|---|---|---|
| | 2011 | 2020 | 2031 | 2040 | 2050 |
| Scenario 1. | 117,884 | 135,620 | 160,336 | 182,165 | 209,878 |
| Scenario 2. | 117,884 | 132,214 | 150,192 | 166,472 | 186,638 |
| Scenario 3. | 117,884 | 130,568 | 145,378 | 158,743 | 175,048 |

### NDDS Sewer

The projected population equivalent loadings in the NDDS Sewer Sub-Catchment under the three growth scenarios examined are summarised in Table 4.4. This represents the available projected load that could be diverted from this larger fraction of the North Dublin sub-catchment, to the Regional WwTP, by an interception of the NDDS sewer. This is independent of, and in addition to, the figures above for the North

Fringe sewer. The detailed analysis of projected population equivalent loading in the NDDS Sewer catchment is included in Appendix C.

**Table 4.4 Summary of Projected PE Loadings – NDDS Sewer Catchment**

| Growth Scenario | Design Year | | | | Future Consideration |
|---|---|---|---|---|---|
| | 2011 | 2020 | 2031 | 2040 | 2050 |
| Scenario 1. | 212,002 | 232,376 | 264,979 | 291,432 | 323,634 |
| Scenario 2. | 212,002 | 225,728 | 251,837 | 275,431 | 304,247 |
| Scenario 3. | 212,002 | 225,755 | 251,235 | 274,222 | 302,256 |

## 4.6 Route 9B (Lucan/Clondalkin) Sub-Catchment

The projected population equivalent loadings in the Route 9B (Lucan/Clondalkin) Sub-Catchment under the three growth scenarios examined are summarised in Table 4.5. This represents the available projected load that could be diverted from this sub-catchment to the Regional WwTP. The detailed analysis of projected population equivalent loading in the Route 9B (Lucan/Clondalkin) sub-catchment is included in Appendix C

**Table 4.5 Summary of Projected PE Loadings – Route 9B (Lucan/Clondalkin) Sewer Catchment**

| Growth Scenario | Design Year | | | | Future Consideration |
|---|---|---|---|---|---|
| | 2011 | 2020 | 2031 | 2040 | 2050 |
| Scenario 1. | 80,996 | 92,336 | 108,091 | 122,632 | 141,063 |
| Scenario 2. | 80,996 | 90,991 | 103,206 | 114,393 | 128,250 |
| Scenario 3. | 80,996 | 90,325 | 100,719 | 110,108 | 121,572 |

In passing, it should be noted that each of these projections constitute loads of substantial magnitude individually, as is to be expected, given that each sub-catchment represents a significant economic and residential centre within the capital city.

## 4.7 Potential for Diversion of Load from the Ringsend Catchment

**Growth Scenario 1**

Under this growth scenario, and given the implied development of load on Ringsend WwTP, it would be necessary to divert the entire sub-catchments of the Route 9C Sewer, the North Fringe Sewer, the NDDS Sewer and the Route 9B (Lucan/Clondalkin) Sewer by 2040, in order to remain within the defined and agreed operational capacity of Ringsend WwTP.

The timing of each diversion and the subsequent load on the Regional WwTP and the residual load on Ringsend WwTP is illustrated in Table 4.6.

**Table 4.6 Potential Load Diversion from Ringsend WwTP – Growth Scenario 1**

| Year | Diverted Sub - Catchments | Load Diverted | Cumulative Load to Regional WwTP | Residual Load on Ringsend WwTP |
|---|---|---|---|---|
| 2022 | Route 9C | 179,698 | 179,698 | 1,938,814 |
| 2027 | North Fringe | 151,519 | 349,952 | 1,953,748 |
| 2033 | NDDS | 270,636 | 657,720 | 1,846,616 |
| 2043 | Route 9B (Lucan/Clondalkin) | 127,893 | 887,233 | 1,989,635 |

Under Growth Scenario 1, even with the above catchments diverted, the residual load on Ringsend WwTP will still exceed the 2.1 million PE capacity at Ringsend by year 2048.

### Growth Scenario 2

Under this growth scenario, it would be necessary to divert the entire sub-catchments of the Route 9C Sewer, and the North Fringe Sewer before 2040, and also the NDDS Sewer in year 2041.

The actual timing of the need for each diversion, and the subsequent load on the Regional WwTP, and the residual load on Ringsend WwTP, is illustrated in Table 4.7.

**Table 4.7 Potential Load Diversion from Ringsend WwTP – Growth Scenario 2**

| Year | Sub - Catchments | Load Diverted | Load to Regional WwTP | Residual Load on Ringsend WwTP |
|---|---|---|---|---|
| 2026 | Route 9C | 179,238 | 179,238 | 1,925,987 |
| 2034 | North Fringe | 155,434 | 351,841 | 1,955,043 |
| 2041 | NDDS | 278,185 | 659,345 | 1,839,774 |

Under this growth scenario, the residual load on the Ringsend WwTP at year 2050 would be 2,043,280PE, which is less than its design capacity.

### Growth Scenario 3

Under this growth scenario, it would be necessary to divert the entire sub-catchments of the Route 9C Sewer, the North Fringe Sewer by 2045, and the NDDS Sewer post 2050.

The actual timing of developing need for each diversion, the subsequent load on the Regional WwTP, and the residual load on Ringsend WwTP is illustrated in Table 4.8.

**Table 4.8 Potential Load Diversion from Ringsend WwTP – Growth Scenario 3**

| Year | Sub - Catchments | Load Diverted | Load to Regional WwTP | Residual Load on Ringsend WwTP |
|---|---|---|---|---|
| 2033 | Route 9C | 186,142 | 186,142 | 1,922,779 |
| 2045 | North Fringe | 166,696 | 376,102 | 1,937,523 |

Under this growth scenario, the residual load on the Ringsend WwTP at year 2050 would be 2,010,977 PE, which is less than its design capacity.

## 4.8 Load Diversion from the Swords WwTP Catchment

Swords WwTP is currently being upgraded to 90,000 PE. Based on the assumption that only load in excess of this upgraded capacity would be diverted to the Regional WwTP, the following diversions would be required.

### Growth Scenario 1

Under this growth scenario the 90,000 PE upgraded capacity at Swords WwTP is exceeded in year 2037, when a surplus load equivalent to 2,547 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 36,095 PE.

### Growth Scenario 2

Under this growth scenario the 90,000 PE upgraded capacity at Swords WwTP is exceeded in year 2047, when a surplus load equivalent to 2,539 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 7,050 PE.

### Growth Scenario 3

Under growth scenario 3 there would be no requirement for load diversion from Swords WwTP up to and beyond year 2050

## 4.9 Load Diversion from the Malahide WwTP Catchment

Based on the assumption that the Malahide WwTP will be upgraded to 25,000 PE, and only load in excess of this upgraded capacity would be diverted to the Regional WwTP, the following diversions would be required.

### Growth Scenario 1

Under this growth scenario, the 25,000 PE upgraded capacity at Malahide WwTP is exceeded in year 2027, when a small surplus load equivalent to 392 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 13,187 PE.

### Growth Scenario 2

Under growth scenario 2, the 25,000 PE upgraded capacity at Malahide WwTP is exceeded in year 2032, when a small surplus load equivalent to 263 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 6,036 PE.

**Growth Scenario 3**

Under growth scenario 3, the 25,000 PE upgraded capacity at Malahide WwTP is exceeded in year 2035, when load equivalent to 238 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 4,300 PE.

## 4.10 Load Diversion from the Lower Liffey Valley (Leixlip WwTP) Catchment

Based on the premise that Leixlip WwTP will be upgraded to 150,000 PE as part of the Lower Liffey Valley Regional Sewerage Scheme and only load in excess of this upgraded capacity would be diverted to the Regional WwTP the following diversions would be required:-

**Growth Scenario 1**

Under this growth scenario, the 150,000 PE upgraded capacity at Leixlip WwTP is exceeded in year 2015, when the first surplus load equivalent to 4,411 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 146,233 PE.

**Growth Scenario 2**

Under this growth scenario, the 150,000 PE upgraded capacity at Leixlip WwTP is exceeded in year 2015, when load equivalent to 4,411 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 67,579 PE.

**Growth Scenario 3**

Under this growth scenario the 150,000 PE upgraded capacity at Leixlip WwTP is exceeded in year 2027, when load equivalent to 1,160 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 21,689 PE.

## 4.11 Load Diversion from the Upper Liffey Valley (Osberstown WwTP) Catchment

Based on the premise that Osberstown WwTP will be upgraded to 130,000 PE as part of the Upper Liffey Valley Regional Sewerage Scheme and only load in excess of this upgraded capacity would be diverted to the Regional WwTP the following diversions would be required;

**Growth Scenario 1**

Under this growth scenario, the 130,000 PE upgraded capacity at Osberstown WwTP is exceeded in year 2023, when load equivalent to 2,309 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 88,167 PE.

**Growth Scenario 2**

Under this growth scenario, the 130,000 PE upgraded capacity at Osberstown WwTP is exceeded in year 2036, when load equivalent to 2,018 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 23,443 PE.

**Growth Scenario 3**

Under this growth scenario the 130,000 PE upgraded capacity at Osberstown WwTP is exceeded in year 2047, when load equivalent to 1,645 PE would have to be diverted to the Regional WwTP. By year 2050 this diverted load would equate to 5,634 PE.

# 5 Diversion of Existing Drainage Network to Orbital Sewers

## 5.1 Introduction

Options for diverting flows from the potential contributing catchments to the Regional WwTP as noted in Section 4 above are discussed in this Section of the report.

It is clear from the growth scenarios, that the need to achieve significant load transfers requires initial attention on those loads which are:-

(a) already developed and currently being passed to Ringsend, and

(b) where existing treatment capacity is not in place.

Thereafter, the diversion of load is a contingent outcome of two variable factors;

(a) the increase of load beyond the ability of existing receiving waters to accept treated effluent, from adjacent existing, maximally expanded local WwTPs (e.g. Swords, Malahide, Leixlip & Osberstown), and

(b) the continuing development of load in already diverted sub-catchments, and in the Ringsend sub-catchment itself.

This approach means that, when first commissioned, the greater part of flows for treatment will in fact originate in Fingal.

## 5.2 Route 9C Sewer

In considering options for diverting flows from the Route 9C sewer it is assumed that the works recommended in the Blanchardstown Regional Drainage Scheme (BRDS) Preliminary Report upstream of the main interception point will be completed in advance of or in parallel with the Greater Dublin Drainage project. This includes for the duplication of the Route 9C sewer by the construction of a parallel pipeline in the floodplain of the Tolka River from the Parlickstown Road Bridge to the M50.

It is proposed to intercept the Route 9C Sewer immediately north west of the M50/N3 Interchange, shown as Option 1 on Fig. 5.1. The point of interception lies north of the River Tolka in the grounds of James Connolly Memorial Hospital. This proposed interception point was previously identified in the Preliminary Report for the Blanchardstown Regional Drainage Scheme (BRDS) as the preferred location from which to drive twin siphons under the M50 to replace the existing Route 9C pipe bridge which crosses the M50 just to the north of the Interchange.


**Fig. 5.1 Diversion Options for Route 9C Sewer to Orbital Sewer**

For the residual Route 9C catchment downstream of the M50 three options for dealing with the flows (ref. options 2, 3 & 4 on Fig 5.1) have been examined as set out hereunder. All options have been considered in conjunction with dealing with potential future flows from the Pelletstown area, refer to Fig. 5.2 below, which is identified as a Key Development Areas (KDA) in the Dublin City Development Plan 2011 - 2017 and therefore one of the key areas in the north city area for future development.


**Fig. 5.2 Foul Drainage Options for the Pelletstown KDA**

Option 2 as shown on Fig. 5.1 is to leave these residual flows continue to flow through one of the Liffey Siphons to the Grand Canal Tunnel sewer. However, this residual flow is insufficient to maintain self cleansing velocities in the Liffey siphon. This concern may be overcome by draining the Pellettstown area in this direction also (Option 2 on Fig. 5.2)

Option 3, as shown on Fig. 5.1, considered collecting these residual flows to a small pumping station and pump them back to the main Route 9C interception point. Crossing of the M50 could be achieved by using the existing pipe bridge as a pipe sleeve for the pumped main in the reverse direction. Future flows from the Pelletstown area could also be drained to the Orbital Sewer by using this pumping station (Option 3 on Fig. 5.2)

Option 4 as shown on Fig. 5.1 examined connecting the residual flows to the head of the NDDS sewer. This option would compete for capacity in the NDDS sewer with future flows from Pelletstown (Option 4 on Fig 5.2) and modelling of the NDDS sewer would be required to confirm this option.

Option 2, allowing the flows in the Route 9C catchment downstream of the M50, is the preferred option. Future flows from the Pelletstown KDA should also be connected to the Route 9C sewer once the catchment upstream of the M50 is diverted. It is recommended that the potential for diverting the Ashtown section of the NDDS sewer, south of the Railway and canal crossing, to the Route 9C sewer in the vicinity of the Phoenix Park, to augment flows through the Liffey Syphons following diversion of the catchment upstream of the M50 be further examined.

**Ashbourne/Ratoath**

The towns of Ashbourne and Ratoath in County Meath currently drain to the Route 9C sewer via a pumping station at Kilbride. The GDSDS recommendations indicated that foul flows from both these towns would be pumped directly to the Orbital Sewer from Kilbride. Modelling work undertaken on the Route 9C sewer as part of the BRDS Preliminary Report also assumed that Ashbourne and Ratoath would be pumped directly to the Orbital Sewer from Kilbride and thus the future foul flows from these two towns were not considered in model runs post 2020 in examining options for upgrading the Route 9C sewer.

Additional model runs, testing revised design scenarios, on the BRDS Route 9C sewer model indicate that capacity exists in the 9C duplication to retain the flows pumped from Ashbourne, Ratoath and Kilbride without significant detriment in the 9C catchment.

Therefore two options for the towns of Ashbourne and Ratoath as shown on Fig. 5.3 will be further examined as depending on the final location of the Regional WwTP and the precise routing of the Orbital sewers it may be more cost effective to retain and transfer these flows with the Route 9C flows.

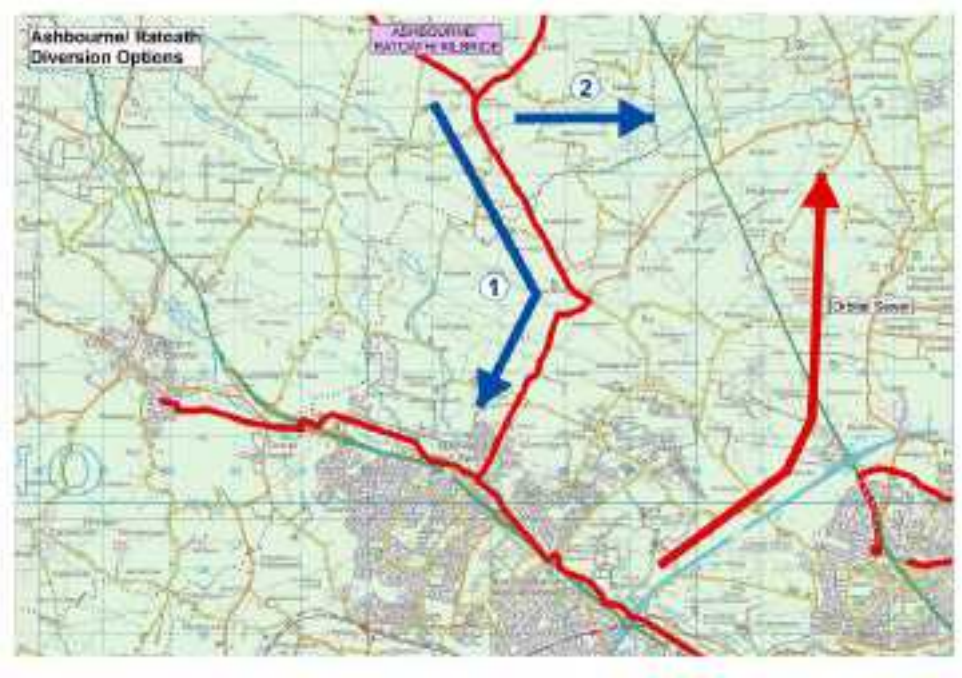



**Fig. 5.3 Connection Options for Ashbourne/Ratoath to Orbital Sewer**

Option 1(Fig. 5.3) considers retaining the connection from Ashbourne and Ratoath to the Route 9C sewer.

Option 2 (Fig. 5.3) examines a direct connection to the Orbital sewer.

## 5.3 North Dublin Catchment

Diversion of this catchment in a single stage is not considered feasible for the following reasons:

- A new pipe would have to be constructed from Sutton pumping station to the new Regional WwTP. Routing of this pipeline would be difficult as a land based route is not available and a sea route would take the pipe under the DART rail line and through the environmentally sensitive Baldoyle Estuary.
- Larger pump sets would have to be installed in Sutton Pumping Station to cater for the higher duty required. (Static head is projected to increase by a minimum of 20m). There may not be sufficient space to retro-fit these larger pump sets within the station.

Therefore it is proposed to intercept and divert the North Dublin Catchment in two stages as set out hereunder and illustrated on Fig. 5.4

Stage 1. Intercept the North Fringe Sewer downstream of the Grange storm tank at Stapolin and divert flows to a new Grange Pumping Station for transfer to the Orbital Sewer, shown as Option 1 on Fig. 5.4. Flows from Portmarnock and Baldoyle Pumping Stations would also be diverted to this new Grange Pumping Station at this stage.


**Fig. 5.4 Connection Options for North Dublin Catchment to Orbital Sewer**

Stage 2. Following the diversion of the North Fringe, Portmarnock and Baldoyle flows, the existing 1,600mm diameter pipe between the Grange Tank and Sutton Pumping Station would have no flow and could therefore be used to transfer flows from the NDDS sewer and Howth/Sutton to the new Grange Pumping Station via Sutton Pumping Station. This is illustrated as Option 2 on Fig. 5.4. The 1,600mm diameter pipe would have to be lined with a suitable liner to allow it act in its new configuration as the rising main from Sutton Pumping Station to the new Grange Pumping Station.

## 5.4 Lower Liffey Valley Catchment

Diversion of the Lower Liffey Valley Catchment, currently draining to Leixlip WwTP, to the Orbital Sewer and Regional WwTP is proposed to be accommodated via a pumped main from Leixlip WwTP to the Route 9C sewer as illustrated in Fig 5.5. It is proposed that the pipeline would be routed parallel to the twin watermains from Leixlip WTP to Ballycoolen.

This option assumes that the duplication of the Route 9C sewer as recommended in the Preliminary Report of the Blanchardstown Regional Drainage Scheme is progressed.

Additional model runs, testing revised design scenarios, on the BRDS Route 9C sewer model indicate that capacity exists in the 9C duplication to receive flows pumped from

Leixlip WwTP without significant detriment in the 9C catchment provided the connection point is downstream of the Mulhuddart syphon.

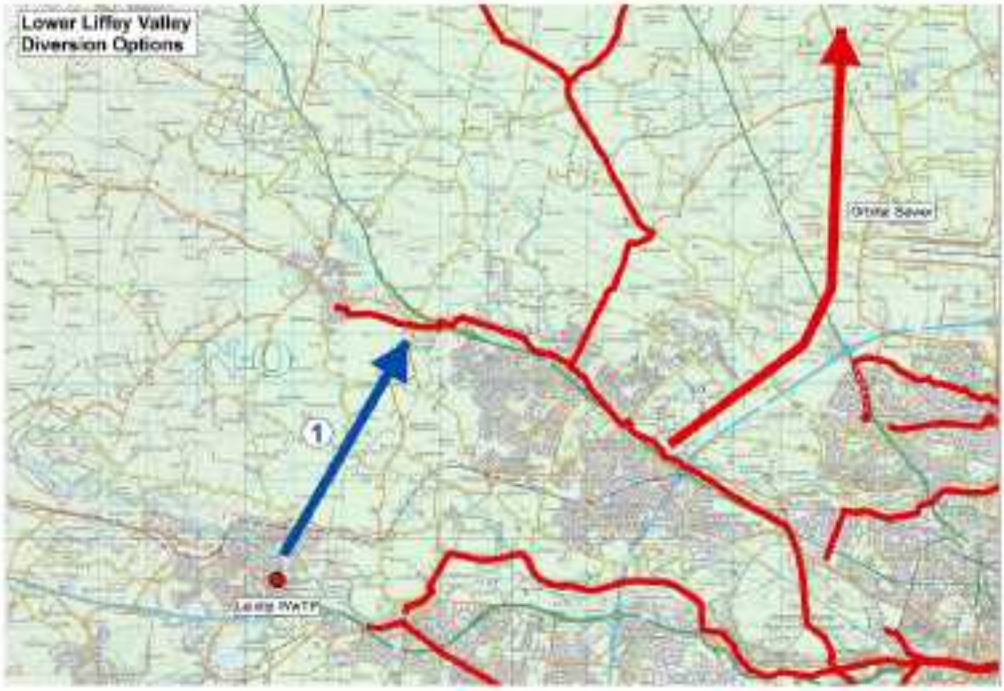



**Fig. 5.5 Connection Options for Leixlip WwTP to Orbital Sewer**

## 5.5 Route 9B (Lucan/Clondalkin) Sewer

A strict limit of 2.0m$^3$/sec was placed on pass forward flows from the Route 9B catchment to the Grand Canal Tunnel Sewer (GCTS) in the GDSDS final strategy recommendations. This limit on pass forward flows was set, due to capacity constraints in the GCTS and particularly in the 9B/9C sewer along Davitt Road / Dolphin Road, and the requirement to accommodate pass forward flows of 2.70m$^3$/sec from the Route 9C catchment in the Davitt Road / Dolphin Road sewer and the GCTS.

The interception and diversion of Route 9C (Blanchardstown) flows to the Orbital sewer, now proposed, will free up capacity in the Grand Canal Tunnel Sewer (GCTS) and more particularly in the 9B/9C Davitt Road/Dolphin Road sewer. This should allow flows greater than the 2.0m$^3$/sec limit set by GDSDS to be passed forward from the Route 9B Catchment to the GCTS.

Modelling work carried out by others as part of the BRDS Preliminary Report indicates that the pipe full capacity of the sewer along Davitt Road/Dolphin Road varies from a minimum of 3.125m$^3$/sec in the flattest sections of this sewer to a maximum of 6.175m$^3$/sec in the steeper sections.

Flow measurement records for the years 2009 and 2010 indicate that flows from the 9B catchment are significantly less than the 2.0m$^3$/s, limit placed on pass forward flows from Route 9B catchment to the GCTS.

Modelling work carried out on the Route 9B sewer, as part of the GDSDS, projected year 2031 Dry Weather Flow at 1.42m$^3$/sec, with a wet weather peak flow estimated as 12.03m$^3$/sec, based on the 100-year return period rainfall of 180 minute duration. It should be noted that significant inflow of storm flows (equivalent to runoff from 7.5% of gross future development area) to the foul sewers was allowed for in the GDSDS models. This volume of storm inflow to the foul sewers is unsustainable as a matter of best practice design and it is recommended that the allowance for storm run-off equivalent to 7.5% of gross future development area to foul sewers be reconsidered, especially in light of the New Development Policies recommended as part of the GDSDS.

Pass forward flows from the 9B catchment to the GCTS should be maximised to make best use of existing downstream infrastructure, before consideration of flow diversion to the Orbital sewer is considered. The volume of storm water entering the Route 9B sewer should also be addressed. Options for maximizing use of downstream infrastructure, particularly the GCTS, include duplication of the Davitt Road sewer (Option 1 on Fig. 5.6) or part diversion of the pass forward flows to the Dolphin Road sewer (Option 2 on Fig. 5.6).


**Fig. 5.6 Duplication Options for 9B Sewer to GCTS**

Should it be necessary to ultimately divert flows to the Orbital Sewer then a pumped option for the flows from the Lucan/Clondalkin area of the 9B catchment as shown on Fig 5.7 is feasible. This option considers pumping these flows towards Leixlip initially to join the flows from Leixlip WwTP that are to be transferred to the Orbital Sewer. These flows will connect to the Orbital sewer via the duplicated 9C sewer. It will be necessary to check that the duplicated 9C sewer has the capacity to accommodate these additional flows.

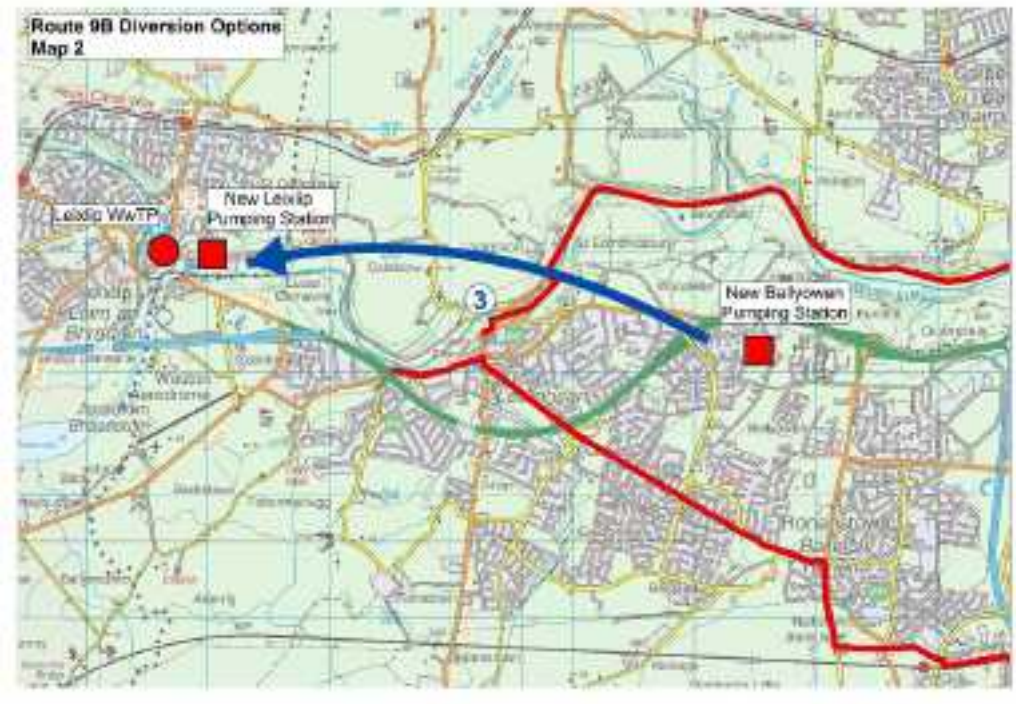



**Fig. 5.7 Connection Options for Lucan/Clondalkin Catchment to Orbital Sewer**

It is recommended that these options be explored in more detail through a DAP study of the 9B Catchment.

## 5.6 Diversion of surplus Flows directly from Ringsend WwTP

This option is presented for discussion as, under Growth Scenario 1, the residual load on Ringsend WwTP, following the diversion of the Route 9C catchment, the North Dublin Catchment and the Route 9B (Lucan/Clondalkin) catchment, is still projected to exceed 2.1 million PE at year 2048.

This option, illustrated in Fig 5.8, considers transferring excess load from Ringsend WwTP via the submarine pipeline and via the new pumping station at Grange, to the Regional WwTP. The limiting factor on this transference is the capacity of the re-lined 1,600mm diameter pipe between Sutton and Grange to carry the combined diverted flows from Ringsend and Sutton.

This option formed part of GCTS Strategy Approach 3, examined during the GDSDS, which envisioned all flows and loads being transferred to an upgraded Ringsend WwTP and excess flows and load being passed forward via the submarine pipeline and Sutton Pumping Station to a new treatment plant in North County Dublin. This strategy approach was ultimately ruled out, mainly due to conveyance bottlenecks in the existing network to Ringsend. It is offered here for discussion as, under the various sub-catchment diversions proposed by the GDD, the network conveyance issues are almost eliminated through the diversion of the northern and western catchments.


**Fig. 5.8 Diversion Option for surplus flows directly from Ringsend WwTP**

# 6 Conclusions and Recommendations

## 6.1 Conclusions

Domestic and Non-Domestic load on Ringsend WwTP will continue to grow under all three growth scenarios examined.

The projected load development on Ringsend WwTP under the three growth scenarios examined indicates that the firm treatment capacity of 2.1 million PE to be provided at Ringsend WwTP will be exceeded between the years 2022 and 2033 depending on what growth is actually realised in the catchment.

Therefore it will be necessary to divert load out of the Ringsend catchment to the proposed Regional WwTP in order to maintain the loading on Ringsend WwTP below its firm treatment capacity of 2.1 million PE.

It is feasible to divert wastewater from developed areas in the north, west and north-west of the Ringsend catchment (including e.g. North Dublin city, Blanchardstown, Mulhuddart, and East Meath) to the new Regional WwTP.

## 6.2 Recommendations

In developing the load transfer to the proposed Regional WwTP for planning purposes it is recommended that Growth Scenario Two, which combines median residential population growth rates with the median commercial load projection and median to low industrial load projections, be used.

Prudent planning suggests that load diversion from Ringsend WwTP commences before its treatment capacity is exceeded. Therefore, it is recommended that flow diversions commence as set out hereunder:

- Route 9C Catchment upstream of the M50 at 2020
- North Fringe Sewer (NFS) Catchment at 2020
- North Dublin Drainage Scheme (NDDS) Catchment at 2035

The required load diversions from the Ringsend Catchment would be satisfied at all stages up to 2040 (the design year horizon) by diverting the wastewater load generated in each of the above catchments.

Post 2045 it may be necessary, depending on actual growth realised, to divert additional wastewater loads from the Ringsend Catchment and this requirement could be satisfied by diverting wastewater load generated in the Route 9B (Lucan/Clondalkin) Catchment of South Dublin to the Regional WwTP.

When the installed or planned treatment capacity at their respective wastewater treatment plants is exceeded diversions would also be required from:

- Lower Liffey Valley (Leixlip WwTP) Catchment in Kildare in 2020;
- Upper Liffey Valley (Osberstown WwTP) Catchment in Kildare post 2035;
- Malahide Catchment in Fingal post 2035; and
- Swords Catchment in Fingal post 2045.

### 6.2.1 Recommended Load Development on Proposed Regional WwTP

The required treatment capacity of the new Regional WwTP is therefore estimated at approximately 340,000 PE at 2020 rising to approximately 720,000 PE at 2040 as illustrated in Table 6.1.

**Table 6.1 Recommended Load Development on Proposed Regional WwTP**

| Year | Sub - Catchment | Load Diverted (PE) | Cumulative Load (PE) on Regional WwTP |
|---|---|---|---|
| 2020 | Route 9C Sewer | 166,700 | 334,000 |
| | North Fringe Sewer | 132,300 | |
| | Leixlip WwTP | 35,000 | |
| 2035 | NDDS Sewer | 262,100 | 670,000 |
| | Osberstown WwTP | 2,000 | |
| | Malahide | 1,500 | |
| 2040 | '- | '- | 720,000 |

# APPENDIX A

## Residential Population – Existing and Future

# A 1. Residential Population

## A1.1 Current Population within the GDA

The Census of 2011 indicates that the population in the Greater Dublin Area (GDA) in April 2011 was **1,804,156** persons. This is an increase of 8.52% from the 2006 population of 1,662,536 persons, which is marginally ahead of the national increase of 8.2%, and represents an annual average percentage growth rate of 1.65% across the GDA.

The GDA has been defined by the Regional Planning Guidelines (RPGs) as the geographical area of Dublin City, Dun Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Meath and Wicklow

The Census results for the GDA and its constituent regions and local authorities are shown in Table A1.1. Figures from the 2006 Census are also provided.

**Table A1.1 Population Numbers in GDA from Census 2006 & 2011**

| Population | 2006 | 2011 | Percentage Increase 2006 - 2011 | Annual Average % Growth Rate |
|---|---|---|---|---|
| Dublin City | 506,211 | 527,612 | 4.23% | 0.83% |
| Dun Laoghaire - Rathdown | 194,038 | 206,261 | 6.30% | 1.23% |
| Fingal | 239,992 | 273,991 | 14.17% | 2.69% |
| South Dublin | 246,935 | 265,205 | 7.40% | 1.44% |
| **Sub - Total Dublin Region** | **1,187,176** | **1,273,069** | **7.24%** | **1.41%** |
| Kildare | 186,335 | 210,312 | 12.87% | 2.45% |
| Meath | 162,831 | 184,135 | 13.08% | 2.49% |
| Wicklow | 126,194 | 136,640 | 8.28% | 1.60% |
| **Sub - Total Mid-East Region** | **475,360** | **531,087** | **11.72%** | **2.24%** |
| **Total GDA** | **1,662,536** | **1,804,156** | **8.52%** | **1.65%** |

## A1.2 Historic Population Trends within the GDA

The population in the GDA at each Census year between 1901 and 2011 is illustrated in Table A1.2 and graphed in Figure A1.1

**Table A1.2 Historic Population Trends in GDA; 1901 - 2011**

| Census Year | Dublin County & Co. Borough | Kildare | Meath | Wicklow | Greater Dublin Area (GDA) |
|---|---|---|---|---|---|
| **1901** | 448,206 | 63,566 | 67,497 | 60,824 | 640,093 |
| **1911** | 477,196 | 66,627 | 65,091 | 60,711 | 669,625 |
| **1926** | 505,654 | 58,028 | 62,969 | 57,591 | 684,242 |
| **1936** | 586,925 | 57,892 | 61,405 | 58,569 | 764,791 |
| **1946** | 636,193 | 64,849 | 66,232 | 60,451 | 827,725 |
| **1951** | 693,022 | 66,437 | 66,337 | 62,590 | 888,386 |
| **1956** | 705,781 | 65,915 | 66,762 | 59,906 | 898,364 |
| **1961** | 718,332 | 64,420 | 65,122 | 58,473 | 906,347 |
| **1966** | 795,047 | 66,404 | 67,323 | 60,428 | 989,202 |
| **1971** | 852,219 | 71,977 | 71,729 | 66,295 | 1,062,220 |
| **1979** | 983,683 | 97,185 | 90,715 | 83,950 | 1,255,533 |
| **1981** | 1,003,164 | 104,122 | 95,419 | 87,449 | 1,290,154 |
| **1986** | 1,021,449 | 116,247 | 103,881 | 94,542 | 1,336,119 |
| **1991** | 1,025,304 | 122,656 | 105,370 | 97,265 | 1,350,595 |
| **1996** | 1,058,264 | 134,992 | 109,732 | 102,683 | 1,405,671 |
| **2002** | 1,122,821 | 163,944 | 134,005 | 114,676 | 1,535,446 |
| **2006** | 1,187,176 | 186,335 | 162,831 | 126,194 | 1,662,536 |
| **2011** | **1,273,069** | **210,312** | **184,135** | **136,640** | **1,804,156** |

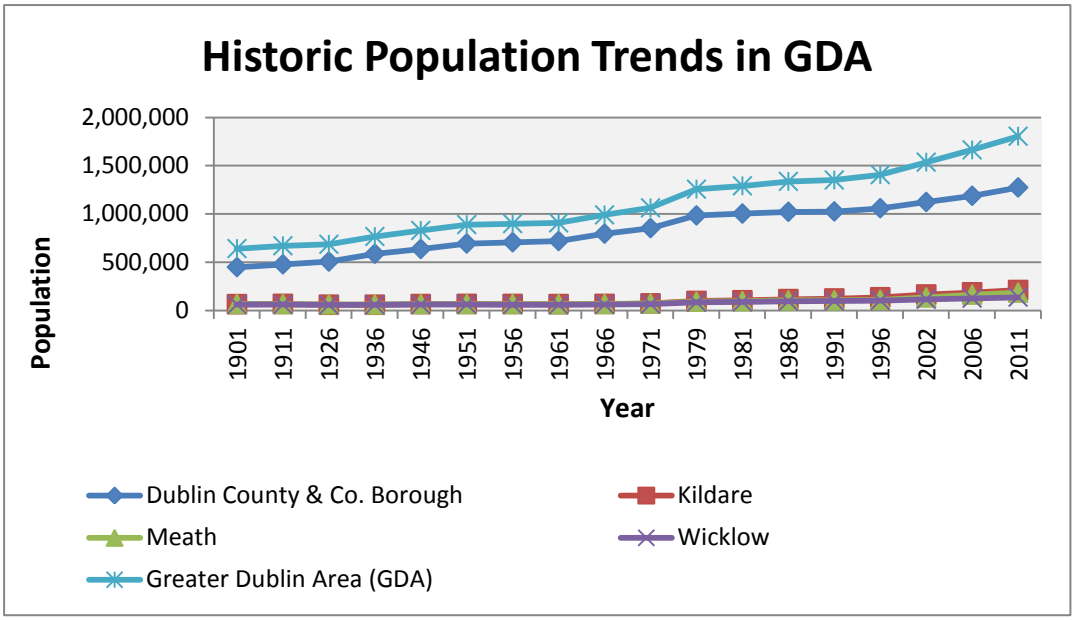



**Figure A1.1: Historic Population Trends in GDA**

### A1.2.1 Average Annual Growth Rates

Average annual percentage growth rates for Dublin County & County Borough, Counties Kildare, Meath & Wicklow and the GDA are shown in Table A1.3. The 100 year and 50 year average annual growth rates for the Dublin Region and the GDA are shown highlighted.

**Table A1.3 Average Annual % Growth Rates**

| Period | Dublin County & Co. Borough | Kildare | Meath | Wicklow | Greater Dublin Area (GDA) |
|---|---|---|---|---|---|
| 1901 - 2011 | 0.954 | 1.094 | 0.917 | 0.739 | 0.946 |
| 1911 - 2011 | 0.986 | 1.156 | 1.045 | 0.815 | 0.996 |
| 1926 - 2011 | 1.092 | 1.526 | 1.270 | 1.022 | 1.147 |
| 1936 - 2011 | 1.038 | 1.735 | 1.475 | 1.136 | 1.151 |
| 1946 - 2011 | 1.073 | 1.827 | 1.586 | 1.263 | 1.206 |
| 1951 - 2011 | 1.019 | 1.939 | 1.716 | 1.310 | 1.188 |
| 1961 - 2011 | 1.151 | 2.395 | 2.101 | 1.712 | 1.386 |
| 1971 - 2011 | 1.008 | 2.717 | 2.385 | 1.825 | 1.333 |
| 1981 - 2011 | 0.797 | 2.371 | 2.215 | 1.499 | 1.124 |
| 1991 - 2011 | 1.088 | 2.733 | 2.830 | 1.714 | 1.458 |
| 2002 - 2011 | 1.405 | 2.806 | 3.594 | 1.966 | 1.808 |

## A1.3 Future Projections of Population within the GDA

### A1.3.1 Introduction

The Regional Planning Guidelines (RPG) for the Greater Dublin Area 2010 - 2022 were published in June 2010 and are the de-facto policy document for population targets and growth up to year 2022 in the Greater Dublin Area (GDA).

The population targets outlined in the RPG and the growth rates derived from these population targets have been referenced when considering possible population projections for the Greater Dublin Drainage Project over the period 2011 – 2022.

Annual growth rates derived from the RPG target population figures for 2016 and 2022 have been examined for the individual local authorities at county level, at metropolitan & hinterland area level as defined by the RPG and at drainage sub-catchment level. These annual growth rates have been sense checked against the potential capacity of residential and mixed-use land zonings as per current County Development Plans to accommodate these annual growth rates.

When considering appropriate population projections post the 2016 – 2022 period reference has also been made to

- Historic population trends within the GDA; and
- Central Statistics Office (CSO) Regional Population Projections; 2008

### A1.3.2 Regional Planning Guidelines 2010

The RPG is a policy document which aims to direct the future growth of the Greater Dublin Area over the medium to long term and works to implement the strategic planning framework set out in the National Spatial Strategy (NSS) published in 2002.

The NSS prescribes population growth target figures for each Region which are analysed by the RPG who in turn set out future population and housing targets for each County and City Development Plan in line with NSS spatial policy.

The RPG inform and direct the City and County Development Plans of each of the Councils in the Greater Dublin Area. They provide the clear policy link between national policies - the National Development Plan and the National Spatial Strategy and other national policy documents and guidance; and Local Authority planning policies and decisions. The RPG aid each of the Councils in the Greater Dublin Area in working together for the better planning of the whole area of Dublin and the surrounding Mid-East Region.

The first RPG for the GDA were adopted in 2004 and set out a strategic framework for planning and development for the region up to 2016. The June 2010 review updates the 2004 document and looks forward to 2022.

Section 4 of the RPG looks at ‘Settlement Strategy, Population and Housing’ for the GDA and sets out target population and housing allocation figures for the years 2016

and 2022 for the individual Local Authorities within the GDA. These are illustrated in Table A1.4 and Table A1.5 below.

**Table A1.4 RPG Population Targets for Local Authorities within the GDA**

| Council | 2006 Census | 2016 | 2022 | Annual Average % Growth Rate[1] | |
|---|---|---|---|---|---|
| | | | | 2006 - 2016 | 2016 - 2022 |
| **Dublin City** | 506,211 | 563,512 | 606,110 | 1.08% | 1.22% |
| **Dun Laoghaire Rathdown** | 194,038 | 222,800 | 240,338 | 1.39% | 1.27% |
| **Fingal** | 239,992 | 287,547 | 309,285 | 1.82% | 1.22% |
| **South Dublin** | 246,935 | 287,341 | 308,467 | 1.53% | 1.19% |
| ***Sub - Total Dublin Region*** | ***1,187,176*** | ***1,361,200*** | ***1,464,200*** | ***1.38%*** | ***1.22%*** |
| **Kildare** | 186,335 | 234,422 | 252,640 | 2.32% | 1.26% |
| **Meath** | 162,831 | 195,898 | 210,260 | 1.87% | 1.19% |
| **Wicklow** | 126,194 | 164,280 | 176,800 | 2.67% | 1.23% |
| ***Sub – Total Mid – East Region*** | ***475,360*** | ***594,600*** | ***639,700*** | ***2.26%*** | ***1.23%*** |
| **GDA Total** | **1,662,536** | **1,955,800** | **2,103,900** | **1.64%** | **1.22%** |

*Note 1. Annual Average % Growth Rates derived from RPG Population Targets for 2016 & 2022*

**Table A1.5 RPG Housing Allocation for Local Authorities within the GDA**

| Council | 2006 Census | 2016 | 2022 |
|---|---|---|---|
| **Dublin City** | 223,098 | 265,519 | 319,903 |
| **Dun Laoghaire Rathdown** | 77,508 | 98,023 | 117,893 |
| **Fingal** | 89,909 | 118,646 | 142,144 |
| **South Dublin** | 87,484 | 115,373 | 137,948 |
| ***Sub - Total Dublin Region*** | ***477,999*** | ***597,561*** | ***717,888*** |
| **Kildare** | 68,840 | 93,748 | 112,477 |
| **Meath** | 61,257 | 79,729 | 95,458 |
| **Wicklow** | 49,088 | 68,351 | 82,012 |
| ***Sub – Total Mid – East Region*** | ***179,185*** | ***241,828*** | ***289,947*** |
| **GDA Total** | **657,184** | **839,389** | **1,007,835** |

A comparison of the projected 2011 population based on the 2006 Census figures and annual average percentage growth rates as derived in Table A1.4 above with the final results from the 2011 Census (Table A1.1) is provided in Table A1.6 below.

**Table A1.6 – Comparison of Census 2011 Results with 2011 Population derived from RPG**

| Council | 2011 (as derived from RPG) | 2011 (from Census Results) |
|---|---|---|
| Dublin City | 534,094 | 527,612 |
| Dun Laoghaire - Rathdown | 207,922 | 206,261 |
| Fingal | 262,696 | 273,991 |
| South Dublin | 266,373 | 265,205 |
| **Sub-Total for Dublin Region** | **1,271,085** | **1,273,069** |
| Kildare | 209,000 | 210,312 |
| Meath | 178,601 | 184,135 |
| Wicklow | 143,983 | 136,640 |
| **Sub–Total for Mid –East Region** | **531,584** | **531,087** |
| **GDA Total** | **1,802,669** | **1,804,156** |

There is good agreement between the 2011 figures (as derived from the RPG) and the 2011 Census figures at regional level and in the GDA itself. However, the census figures for Dublin City and Wicklow are behind the RPG derived figures by 1.21% and 5.10% respectively, whereas Fingal and Meath are ahead of the projected figures by 4.42% and 3.10% respectively.

### A1.3.3 Population Distribution in Metropolitan & Hinterland Areas of GDA

As part of the planning framework, the Regional Planning Guidelines allocate housing and population targets for the individual counties within the GDA based on national and regional population targets set by the NSS.

Under the NSS targets, the Dublin Metropolitan Area has a population target of 1,373,900 for 2016 and 1,488,700 for 2022. The population and housing distribution for the Metropolitan Area for target year 2016 from a baseline year of 2006 is set out in the RPG as shown in Table A1.7

**Table A1.7 RPG Population & Housing Distribution in Metropolitan Area**

| Total Metropolitan Population 2016 | Metropolitan Population to be Accommodated in Each Region | Metropolitan Population Allocated to Each Council | | Proportion of Total Housing Allocated to be directed to the Metropolitan Area 2006 - 2016 |
|---|---|---|---|---|
| GDA: Minimum of 1,373,900<br><br>Provided for by RPGs: 1,424,877 | Dublin: 1,287,914 | Dublin City | 563,512 | 42,421 (100%) |
| | | Dun Laoghaire Rathdown | 206,322 | 19,284 (94%) |
| | | Fingal | 236,157 | 24,426 (85%) |
| | | South Dublin | 281,923 | 27,610 (99%) |
| | Mid East: 136,963 | Kildare | 67,012 | 8,718 (35%) |
| | | Meath | 13,738 | 2,032 (11%) |
| | | Wicklow | 56,213 | 8,090 (42%) |

Table A1.8 illustrates the target population figures for each local authority split between Metropolitan and Hinterland areas for 2016 (as per the RPG) and 2022 (assumed). Average annual growth rates have been recalculated based on this Metropolitan/Hinterland split of future populations.

**Table A1.8 RPG Population Targets for Metropolitan and Hinterland Areas of GDA**

| Council | 2006 Census | 2016[1] | 2022[2] | Annual Average % Growth Rate | |
|---|---|---|---|---|---|
| | | | | 2006 - 2016 | 2016 - 2022 |
| **Metropolitan Area** | | | | | |
| Dublin City | 506,211 | 563,512 | 606,110 | 1.08% | 1.22% |
| Dun Laoghaire Rathdown | 193,054 | 206,322 | 222,461 | 0.67% | 1.26% |
| Fingal | 197,762 | 236,157 | 254,701 | 1.79% | 1.27% |
| South Dublin | 245,087 | 281,923 | 302,174 | 1.41% | 1.16% |
| *Sub-Total Dublin Region Metropolitan Area* | *1,142,114* | *1,287,914* | *1,385,446* | *1.21%* | *1.22%* |
| Kildare | 51,645 | 67,012 | 74,701 | 2.64% | 1.83% |
| Meath | 9,770 | 13,738 | 16,079 | 3.47% | 2.66% |
| Wicklow | 42,967 | 56,213 | 62,601 | 2.72% | 1.81% |
| *Sub-Total Mid-East Region Metropolitan Area* | *104,382* | *136,963* | *153,381* | *2.75%* | *1.90%* |
| **Sub-Total Metropolitan Area** | **1,246,496** | **1,424,877** | **1,538,827** | **1.34%** | **1.29%** |

| | | | | | |
|---|---|---|---|---|---|
| **Hinterland Area** | | | | | |
| Dun Laoghaire Rathdown | 984 | 16,478 | 17,877 | 32.55% | 1.37% |
| Fingal | 42,230 | 51,390 | 54,584 | 1.98% | 1.01% |
| South Dublin | 1,848 | 5,418 | 6,293 | 11.36% | 2.53% |
| *Sub-Total Dublin Region Hinterland Area* | *45,062* | *73,286* | *78,754* | *4.98%* | *1.21%* |
| Kildare | 134,690 | 167,410 | 177,939 | 2.20% | 1.02% |
| Meath | 153,061 | 182,160 | 194,181 | 1.76% | 1.07% |
| Wicklow | 83,227 | 108,067 | 114,199 | 2.65% | 0.92% |
| *Sub-Total Mid-East Region Hinterland Area* | *370,978* | *457,637* | *486,319* | *2.12%* | *1.02%* |
| **Sub – Total Hinterland Area** | **416,040** | **530,923** | **565,073** | **2.47%** | **1.04%** |
| **Total GDA** | **1,662,536** | **1,955,800** | **2,103,900** | **1.64%** | **1.22%** |

*Note 1. As per Regional Planning Guidelines (RPG) 2010.*

*Note 2. Assumed Metropolitan/Hinterland split of RPG Population Target for Local Authorities for 2022*

### A1.3.4 CSO 'Regional Population Projections'

The Central Statistics Office (CSO) published its Regional Population Projections 2011 – 2026 in December 2008

This publication contains regional projections of the population for each year from 2006 to 2026 classified by sex and single year of age. These projections are based on future trends in (F) fertility; mortality and (M) migration (international & internal) and are presented in combinations of fertility and migration assumptions (e.g. M2F1 Recent; M2F1 Traditional).

The CSO Regional Population projections for the GDA are illustrated in Table A1.9 below and are presented here for comparison purposes to the proposed population growth scenarios for the Greater Dublin Drainage project

**Table A1.9 CSO Population Projections for the GDA 2006-2026 (Thousands)**

| Scenario | 2006 | 2011 | 2016 | 2021 | 2026 | Annual Average % Increase (2006 – 2026) |
|---|---|---|---|---|---|---|
| **M2F1 Recent** | 1,662 | 1,845 | 2,001 | 2,126 | 2,195 | 1.4% |
| **M2F1 Traditional** | 1,662 | 1,863 | 2,068 | 2,263 | 2,413 | 1.9% |
| **M0F1 Recent** | 1,662 | 1,718 | 1,769 | 1,803 | 1,816 | 0.4% |
| **M0F1 Traditional** | 1,662 | 1,735 | 1,831 | 1,927 | 2,010 | 1.0% |

# APPENDIX B

## Non-Domestic Loads – Existing and Future

# B1 Non-Domestic Loads

## B1.1 Commercial and Institutional Sector

The load contribution from commercial and institutional sources is difficult to accurately assess due to the lack of legislation in place to provide complete monitoring and licensing of this sector (e.g. retail units, office blocks etc.).

The National Urban Waste Water Study, (DEHLG, 2004) used the following relationship in estimating commercial and institutional contribution to wastewater load

- Commercial loading = 16% of domestic/residential loading

This relationship has been used extensively in the estimation of flow and load for design purposes and is widely accepted at a local and national level in Ireland (source: National Urban Waste Water Study, DEHLG, vol 2, part A, section 5, 2004).

The load contribution from commercial and institutional sources in the Ringsend WwTP catchment have been estimated by deducting known residential and industrial contributions from the total load measured at the treatment plant. In this manner the commercial and institutional load contribution to Ringsend WwTP in 2011 has been estimated at 423,480PE or c.39% of residential contribution.

It has not been possible to allocate this commercial and institutional load between drainage sub-catchments. Therefore, the commercial and institutional contribution in the peripheral, predominantly residential sub-catchments of the Ringsend catchment has been estimated using the national average of 16% of domestic/residential loadings.

For other wastewater catchments in the Greater Dublin Area, where accurate information was not available the commercial and institutional contribution to treatment plant loading has been estimated again using the national average of 16% of domestic/residential loading.

Future commercial load will be grown at the same growth rate as that used for the residential population as per Table A1.32.

## B1.2 Industrial Sector

Industrial discharges are licensed under either the Integrated Pollution Prevention Control (IPPC) Licence with the EPA as the competent authority or a Waste Licence (Section 16) issued by the Local Authority.

### Ringsend WwTP Catchment

The Licenced and Actual utilized industrial PE discharging to the Ringsend catchment from the four main local authorities in 2008 is illustrated in Table B1.1. The Licensed discharge is significantly higher than that utilized by most of the Industrial Users with only c. 22% of the allocated licenced industrial PE actually utilized in 2008.

**Table B1.1 Licenced and Actual Utilised Industrial PE – Ringsend WwTP**

| Local Authority | Allocated PE Licences | Utilised PE | % of Allocation Used |
|---|---|---|---|
| Dublin City | 617,000 | 150,100 | 25% |
| Dun Laoghaire Rathdown | 40,000 | 10,250 | 25% |
| Fingal | 161,300 | 9,550 | 6% |
| South Dublin | 220,000 | 51,000 | 23% |
| **Total (to Ringsend WwTP)** | **1,038,300** | **220,900** | **22%** |

The Licenced and Actual utilized industrial PE discharging to the northern and western sub - catchments of the Ringsend catchment from the four main local authorities in 2008 is illustrated in Table B1.2.

**Table B1.2 Licenced and Actual Utilised Industrial PE – Northern & Western Sub-Catchments**

| Local Authority / Sub - Catchment | | Allocated PE Licences | Utilised PE | % of Allocation Used |
|---|---|---|---|---|
| Dublin City | | | | |
| | North Fringe Sewer | 59,400 | 4,600 | 7.7% |
| | NDDS Sewer | 112,850 | 16,550 | 14.7% |
| Fingal | | | | |
| | Route 9C Sewer | 146,800 | 6,450 | 4.4% |
| | North Fringe Sewer | 14,500 | 3,100 | 21.4% |
| South Dublin | | | | |
| | Route 9B (Lucan/Clondalkin) | 6,050 | 1,400 | 23.2% |
| **Total** | | **339,600** | **32,100** | **9.5%** |

33% of total licenced industrial discharges in the Ringsend catchment are located in the northern and western catchments indicated in Table B1.2 however these industries represented only 14% of the actual utilised industrial PE in 2008 in the Ringsend catchment.

Given the current economic situation both nationally and internationally, it is likely that this industrial load will decrease further, in the short term at least. It is also local authority policy within the Dublin Region for new and amended trade licence applications to reduce permitted industrial discharges to domestic strength.

In considering allowance for future industrial loadings on Ringsend WwTP for the proposed extension works, Dublin City Council (Ringsend Wastewater Treatment Works Extension Environmental Impact Statement, March 2012) deemed it prudent to look at the actual allocations and consider total loadings if existing License holders increased their discharges to that stated in their discharge licences as there is currently significantly more PE licensed than is actually used. It was also deemed equally prudent to plan for the inclusion of future industrial development in the catchment.

An allowance for new controlled industrial development in the Ringsend catchment of 400,000 PE at year 2025 (Ringsend WwTP design year) was therefore proposed. This allocation is c.80% higher than that currently measured by the four Local Authorities and represents an annual average growth of c.4.3% in this sector.

As load is proposed to be diverted from Ringsend WwTP to the proposed new Regional WwTP the allowance of 400,000 PE at year 2025 is considered to apply for new controlled industrial development in the catchments draining to both the Ringsend WwTP and the proposed new Regional WwTP.

As the design year for the proposed new Regional WwTP has been set at 2040 further allowances for industrial development in the Ringsend catchment and the new Regional WwTP catchment post 2025 are required. An allowance for new controlled development in the combined catchments of Ringsend WwTP and the new Regional WwTP of 500,000 PE at year 2040 and 575,000 PE at year 2050 is therefore proposed.

In applying the above allowances for new controlled industrial development in the combined catchments of Ringsend WwTP and the new Regional WwTP the following growth scenarios have been considered:

| Growth Scenario | Description |
|---|---|
| Nr 1 | 220,870 PE existing load at year 2011<br>400,000 PE allowance at year 2025 (c.4.3% growth rate per annum 2011 to 2025)<br>500,000 PE allowance at year 2040 (c.1.5% growth rate per annum 2025 to 2040)<br>575,000 PE allowance at year 2050 (c.1.5% growth rate per annum 2040 to 2050) |
| Nr 2 | Maintain industrial load at same percentage of total load to 2050 |
| Nr 3 | Industrial load to grow at 0.7% per annum |

**Swords WwTP Catchment**

Seven industrial facilities are licenced to discharge to the foul sewer network in the Swords WwTP catchment. Two of these facilities are licensed under the Integrated Pollution Prevention Control (IPPC) Licence which requires on-site treatment to the effluent prior to discharge to the sewer network. The other five industrial facilities have a Waste Licence (Section 16) issued by Fingal County Council.

The actual utilised industrial PE discharging to the Swords WwTP catchment is estimated as 3,000 PE in 2011.

In consideration of the Swords Masterplan Document "Strategic Vision for 2035" , which indicates that Swords as a designated Future City will expand its population to 100,000 persons by the year 2030 an appropriate allowance for new controlled industrial development in the Swords catchment is required. The following scenarios are proposed.

| Growth Scenario | Description |
|---|---|
| Nr 1 | 3,000 PE existing load at year 2011<br>25,000 PE allowance at year 2050 (c.5.6% growth rate per annum 2011 to 2050) |
| Nr 2 | 3,000 PE existing load at year 2011<br>15,000 PE allowance at year 2050 (c.4.2% growth rate per annum 2011 to 2050) |
| Nr 3 | 3,000 PE existing load at year 2011<br>7,500 PE allowance at year 2050 (c.2.4% growth rate per annum 2011 to 2050) |

**Malahide WwTP Catchment**

Three small industrial facilities are licenced to discharge to the foul sewer network in the Malahide WwTP catchment under a Waste Licence (Section 16) issued by Fingal County Council. Flows and loads from these premises are small, and have been deemed to be included in the allowance for the commercial and institutional contribution to wastewater loads.

Likewise future industrial loadings have been deemed included in the future allowance for the commercial and institutional contribution to wastewater loads in the Malahide catchment.

**Lower Liffey Valley Catchment (Leixlip WwTP)**

A major industrial entity in the Lower Liffey Valley Catchment has a reserve capacity for its industrial discharge to Leixlip WwTP of 1,350kg/day of BOD equivalent to 22,500 PE. However, in the first three months of 2011 its average daily discharge was only the equivalent of 4,500 PE.

There is existing permission to increase the reserve capacity for this industrial entity to 3,800 kg/day of BOD, which is equivalent to 63,333 PE and it has recently entered discussions with Kildare County Council to increase its reserve capacity to 5,082 kg/day of BOD, which is equivalent to 84,700 PE.

Kildare County Council also has a stated objective to reserve and allocate 30,000 PE of total capacity at the upgraded Leixlip WwTP to development that yields long term sustainable employment (objective WW 3 of the Kildare County Development Plan 2011 – 2017)

Kildare County Council has indicated to the Greater Dublin Drainage project team that it seeks to provide for these requirements at the upgraded Leixlip WwTP with any flow and load in excess of the upgraded treatment capacity (150,000 PE) to be transferred to the Regional WwTP.

Therefore three future scenarios have been considered as follows:

| Growth Scenario | Description |
|---|---|
| Nr 1 | Apply the full increased (84,700 PE) load from the major industry from 2013 and KCC future reserve capacity (30,000 PE) requirement applied from year 2020 (Regional WwTP in operation |
| Nr 2 | Apply the full increased (84,700 PE) load from the major industry from 2013 and half of KCC future reserve capacity (15,000 PE) requirement applied from year 2020 (Regional WwTP in operation). |
| Nr 3 | Apply a reduced load of 63,333 PE from the major industry from 2012 with no allowance for other industry. |

**Upper Liffey Valley Catchment (Osberstown WwTP)**

The actual utilised industrial PE discharging to the Osberstown WwTP catchment was reported Kildare County Council as 10,821 PE in year 2011.

Kildare County Council has a stated objective to reserve and allocate 20,000 PE of total capacity at the upgraded Osberstown WwTP to development that yields long term sustainable employment (objective WW 2 of the Kildare County Development Plan 2011 – 2017).

Kildare County Council has indicated to the Greater Dublin Drainage project team that it seeks to provide for these requirements at the upgraded Osberstown WwTP, however, there is potential, subject strategic review, that any flow and load in excess of the upgraded treatment capacity (130,000 PE) be transferred to the Regional WwTP

Three future scenarios for industrial PE discharges to the Osberstown WwTP are considered as follows:

| Growth Scenario | Description |
|---|---|
| Nr 1 | An annual growth rate of 1.50% applied to the 2010 actual utilised industrial PE. An additional 20,000 PE is also applied from year 2016 (upgraded Osberstown WwTP in operation) to satisfy KCC future reserve capacity requirement. |
| Nr 2 | An annual growth rate of 1.25% applied to the 2010 actual utilised industrial PE. In addition apply half (10,000 PE) of KCC's required future reserve capacity from year 2016 (upgraded Osberstown WwTP in operation) |
| Nr 3 | An annual growth rate of 1.00% applied to the 2010 actual utilised industrial PE with no allowance for future reserve capacity. |

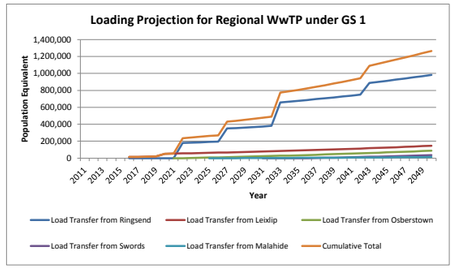
# APPENDIX C

## Loading Analysis on Wastewater Treatment Plants

**Regional WwTP - Load Development**

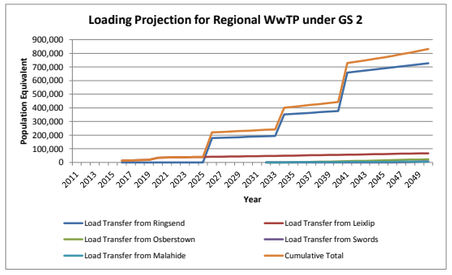
Regional WwTP - Load Projections under Growth Scenario 1

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load Transfer from Ringsend | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 179,698 | 183,423 | 187,236 | 191,137 | 194,749 | 349,952 | 355,865 | 361,886 | 368,016 | 374,257 | 380,612 | 657,720 | 667,184 | 676,800 | 686,570 | 696,498 | 706,586 | 716,838 | 727,256 | 737,779 | 748,472 | 887,233 | 900,081 | 913,135 | 926,398 | 939,875 | 953,570 | 967,485 | 981,627 |
| Load Transfer from Leixlip | | | | | | 14,251 | 16,140 | 18,079 | 20,069 | 52,111 | 54,208 | 56,360 | 58,568 | 60,835 | 63,162 | 65,550 | 68,001 | 70,517 | 73,100 | 75,750 | 78,471 | 81,263 | 84,129 | 87,071 | 90,090 | 93,189 | 96,370 | 99,635 | 102,986 | 106,426 | 109,956 | 113,580 | 117,299 | 121,116 | 125,034 | 129,056 | 133,184 | 137,421 | 141,769 | 146,233 |
| Load Transfer from Osberstown | | | | | | | | | | | 0 | 0 | 2,309 | 4,689 | 7,121 | 9,604 | 12,141 | 14,732 | 17,378 | 20,081 | 22,843 | 25,663 | 28,544 | 31,487 | 34,493 | 37,564 | 40,700 | 43,904 | 47,177 | 50,520 | 53,934 | 57,423 | 60,986 | 64,625 | 68,343 | 72,141 | 76,021 | 79,984 | 84,032 | 88,167 |
| Load Transfer from Swords | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 2,547 | 4,675 | 6,867 | 9,127 | 11,456 | 13,858 | 16,336 | 18,893 | 21,533 | 24,258 | 27,073 | 29,981 | 32,987 | 36,095 |
| Load Transfer from Malahide | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 1,309 | 1,780 | 2,259 | 2,747 | 3,244 | 3,750 | 4,264 | 4,788 | 5,321 | 5,864 | 6,417 | 6,979 | 7,551 | 8,134 | 8,727 | 9,331 | 9,945 | 10,571 | 11,208 | 11,856 | 12,515 | 13,187 |
| **Cumulative Total** | | | | | | 14,251 | 16,140 | 18,079 | 20,069 | 52,111 | 54,208 | 236,057 | 244,300 | 252,760 | 261,420 | 269,903 | 430,093 | 441,114 | 453,673 | 465,628 | 477,830 | 490,286 | 773,637 | 789,491 | 805,647 | 822,111 | 841,437 | 860,665 | 880,285 | 900,307 | 920,677 | 941,467 | 1,090,581 | 1,114,047 | 1,137,991 | 1,162,424 | 1,187,360 | 1,212,811 | 1,238,789 | 1,265,309 |




Regional WwTP - Load Projections under Growth Scenario 2

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load Transfer from Ringsend | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 179,238 | 181,300 | 183,385 | 185,494 | 187,627 | 189,784 | 191,967 | 194,175 | 351,841 | 355,887 | 359,980 | 364,120 | 368,307 | 372,543 | 376,827 | 659,345 | 666,511 | 673,754 | 681,076 | 688,479 | 695,962 | 703,527 | 711,175 | 718,906 | 726,721 |
| Load Transfer from Leixlip | | | | | | 14,251 | 15,560 | 16,894 | 18,251 | 34,634 | 36,042 | 37,476 | 38,393 | 39,321 | 40,260 | 41,209 | 42,169 | 43,141 | 44,123 | 45,117 | 46,123 | 47,139 | 48,168 | 49,208 | 50,261 | 51,325 | 52,402 | 53,491 | 54,592 | 55,707 | 56,834 | 57,974 | 59,127 | 60,293 | 61,473 | 62,667 | 63,874 | 65,095 | 66,330 | 67,579 |
| Load Transfer from Osberstown | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 2,018 | 3,436 | 4,871 | 6,322 | 7,790 | 9,275 | 10,777 | 12,297 | 13,835 | 15,390 | 16,964 | 18,555 | 20,166 | 21,795 | 23,443 |
| Load Transfer from Swords | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,539 | 4,008 | 5,512 | 7,050 |
| Load Transfer from Malahide | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 1,145 | 1,445 | 1,749 | 2,057 | 2,368 | 2,683 | 3,001 | 3,323 | 3,649 | 3,978 | 4,312 | 4,649 | 4,990 | 5,335 | 5,683 | 6,036 |
| **Cumulative Total** | | | | | | 14,251 | 15,560 | 16,894 | 18,251 | 34,634 | 36,042 | 37,476 | 38,393 | 39,321 | 40,260 | 220,447 | 223,469 | 226,525 | 229,617 | 232,744 | 235,907 | 239,106 | 242,342 | 401,049 | 407,293 | 414,769 | 421,707 | 428,726 | 435,825 | 443,006 | 728,455 | 738,585 | 748,827 | 759,183 | 769,654 | 780,241 | 793,485 | 805,778 | 818,226 | 830,830 |

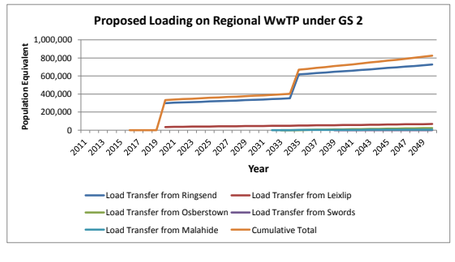



Regional WwTP - Load Projections under Growth Scenario 3

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load Transfer from Ringsend | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 186,142 | 187,977 | 189,831 | 191,703 | 193,593 | 195,502 | 197,430 | 199,377 | 201,344 | 203,330 | 205,335 | 207,361 | 376,102 | 379,805 | 383,546 | 387,323 | 391,138 | 394,990 |
| Load Transfer from Leixlip | | | | | | | | | | | | | | 0 | 0 | 0 | 1,160 | 1,958 | 2,765 | 3,579 | 4,401 | 5,232 | 6,071 | 6,919 | 7,774 | 8,639 | 9,512 | 10,394 | 11,284 | 12,184 | 13,092 | 14,010 | 14,937 | 15,873 | 16,818 | 17,773 | 18,737 | 19,711 | 20,695 | 21,689 |
| Load Transfer from Osberstown | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 1,645 | 2,962 | 4,291 | 5,634 |
| Load Transfer from Swords | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 |
| Load Transfer from Malahide | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 1,002 | 1,262 | 1,525 | 1,790 | 2,058 | 2,329 | 2,602 | 2,878 | 3,157 | 3,438 | 3,723 | 4,010 | 4,300 |
| **Cumulative Total** | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,160 | 1,958 | 2,765 | 3,579 | 4,401 | 5,232 | 192,213 | 194,896 | 197,605 | 200,342 | 203,105 | 206,898 | 209,977 | 213,086 | 216,226 | 219,398 | 222,601 | 225,835 | 395,798 | 400,735 | 407,367 | 413,719 | 420,134 | 426,613 |

Regional WwTP - Proposed Loadings under Growth Scenario 2

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load Transfer from Ringsend | | | | | | | | | | 298,907 | 302,792 | 306,730 | 310,257 | 313,825 | 317,434 | 321,085 | 324,777 | 328,512 | 332,290 | 336,111 | 339,977 | 343,886 | 347,841 | 351,841 | 617,950 | 624,663 | 631,450 | 638,311 | 645,246 | 652,257 | 659,345 | 666,511 | 673,754 | 681,076 | 688,479 | 695,962 | 703,527 | 711,175 | 718,906 | 726,721 |
| Load Transfer from Leixlip | | | | | | | | | | 34,634 | 36,042 | 37,476 | 38,393 | 39,321 | 40,260 | 41,209 | 42,169 | 43,141 | 44,123 | 45,117 | 46,123 | 47,139 | 48,168 | 49,208 | 50,261 | 51,325 | 52,402 | 53,491 | 54,592 | 55,707 | 56,834 | 57,974 | 59,127 | 60,293 | 61,473 | 62,667 | 63,874 | 65,095 | 66,330 | 67,579 |
| Load Transfer from Osberstown | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 2,018 | 3,436 | 4,871 | 6,322 | 7,790 | 9,275 | 10,777 | 12,297 | 13,835 | 15,390 | 16,964 | 18,555 | 20,166 | 21,795 | 23,443 |
| Load Transfer from Swords | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Load Transfer from Malahide | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 1,145 | 1,445 | 1,749 | 2,057 | 2,368 | 2,683 | 3,001 | 3,323 | 3,649 | 3,978 | 4,312 | 4,649 | 4,990 | 5,335 | 5,683 | 6,036 |
| **Cumulative Total** | | | | | | 0 | 0 | 0 | 0 | 333,541 | 338,834 | 344,205 | 348,650 | 353,146 | 357,694 | 362,294 | 366,947 | 371,653 | 376,413 | 381,229 | 386,099 | 391,026 | 396,009 | 401,049 | 669,355 | 679,452 | 689,037 | 698,729 | 708,529 | 718,437 | 728,455 | 738,585 | 748,827 | 759,183 | 769,654 | 780,241 | 790,946 | 801,770 | 812,714 | 823,780 |



**Potential for Diversion of Load from Ringsend Wwtp and Potential Load on Proposed Regional WwTP - Growth Scenario 1**

**Growth Scenario 1 - Diversion of Loads from Ringsend WwTP**

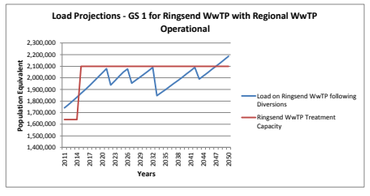
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Projected Load on Ringsend WwTP** | **1,790,678** | **0** | **0** | **1,740,000** | **1,770,534** | **1,801,773** | **1,833,737** | **1,866,450** | **1,899,935** | **1,934,217** | **1,969,322** | **2,005,276** | **2,042,106** | **2,079,842** | **2,118,512** | **2,158,147** | **2,198,780** | **2,240,462** | **2,271,861** | **2,303,700** | **2,335,985** | **2,368,724** | **2,401,922** | **2,435,585** | **2,469,721** | **2,504,336** | **2,539,437** | **2,575,030** | **2,611,122** | **2,647,721** | **2,684,833** | **2,722,467** | **2,760,535** | **2,798,781** | **2,837,556** | **2,876,868** | **2,916,726** | **2,957,135** | **2,998,104** | **3,039,641** | **3,081,754** | **3,124,450** | **3,167,592** |
| Projected Load on Route 9C Sewer | | | | 143,854 | 146,760 | 149,730 | 152,768 | 155,874 | 159,050 | 162,299 | 165,622 | 169,022 | 172,499 | 176,057 | 179,698 | 183,423 | 187,236 | 191,137 | 194,749 | 198,433 | 202,190 | 206,023 | 209,933 | 213,922 | 217,991 | 222,142 | 226,377 | 230,698 | 235,107 | 239,605 | 244,195 | 248,879 | 253,659 | 258,521 | 263,483 | 268,547 | 273,716 | 278,991 | 284,375 | 289,870 | 295,480 | 301,206 | 307,052 |
| **Balance of Load on Ringsend WwTP following diversion of Route 9C** | | | | | | | | | | | | | | | **1,938,814** | **1,974,724** | **2,011,545** | **2,049,325** | **2,077,112** | **2,105,267** | **2,133,795** | **2,162,700** | **2,191,988** | **2,221,663** | **2,251,730** | **2,282,194** | **2,313,060** | **2,344,332** | **2,376,015** | **2,408,116** | **2,440,638** | **2,473,588** | **2,506,877** | **2,540,260** | **2,574,073** | **2,608,321** | **2,643,010** | **2,678,144** | **2,713,730** | **2,749,771** | **2,786,274** | **2,823,243** | **2,860,540** |
| Projected Load on North Fringe Sewer | | | | 117,884 | 119,657 | 121,464 | 123,307 | 125,186 | 127,103 | 129,168 | 131,275 | 133,425 | 135,620 | 137,860 | 140,146 | 142,481 | 144,865 | 147,299 | 149,394 | 151,519 | 153,675 | 155,863 | 158,083 | 160,336 | 162,622 | 164,941 | 167,295 | 169,683 | 172,107 | 174,567 | 177,063 | 179,595 | 182,165 | 184,758 | 187,388 | 190,058 | 192,766 | 195,515 | 198,304 | 201,134 | 204,006 | 206,920 | 209,878 |
| **Balance of Load on Ringsend WwTP following diversion of North Fringe Sewer** | | | | | | | | | | | | | | | | | | | | **1,953,748** | **1,980,120** | **2,006,838** | **2,033,905** | **2,061,328** | **2,089,109** | **2,117,253** | **2,145,765** | **2,174,648** | **2,203,908** | **2,233,549** | **2,263,576** | **2,293,993** | **2,324,711** | **2,355,502** | **2,386,684** | **2,418,263** | **2,450,244** | **2,482,629** | **2,515,426** | **2,548,637** | **2,582,268** | **2,616,323** | **2,650,662** |
| Project Load on NDDS Sewer | | | | | | | | | | | | | 232,376 | 235,508 | 238,706 | 241,973 | 245,310 | 248,720 | 251,358 | 254,023 | 256,718 | 259,442 | 262,195 | 264,979 | 267,792 | 270,636 | 273,512 | 276,418 | 279,356 | 282,326 | 285,329 | 288,364 | 291,432 | 294,500 | 297,601 | 300,735 | 303,902 | 307,104 | 310,340 | 313,610 | 316,916 | 320,257 | 323,634 |
| **Balance of Load on Ringsend WwTP following diversion of North Fringe Sewer** | | | | | | | | | | | | | | | | | | | | | | | | | | **1,846,616** | **1,872,253** | **1,898,230** | **1,924,552** | **1,951,223** | **1,978,247** | **2,005,629** | **2,033,279** | **2,061,002** | **2,089,083** | **2,117,529** | **2,146,341** | **2,175,526** | **2,205,086** | **2,235,027** | **2,265,352** | **2,296,066** | **2,327,028** |
| Projected Load on Route 9B Sewer (Lucan / Clondalkin) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 122,632 | 124,362 | 126,115 | 127,893 | 129,697 | 131,525 | 133,380 | 135,260 | 137,168 | 139,102 | 141,063 |
| **Balance of Load on Ringsend WwTP** | | | | **1,740,000** | **1,770,534** | **1,801,773** | **1,833,737** | **1,866,450** | **1,899,935** | **1,934,217** | **1,969,322** | **2,005,276** | **2,042,106** | **2,079,842** | **1,938,814** | **1,974,724** | **2,011,545** | **2,049,325** | **2,077,112** | **1,953,748** | **1,980,120** | **2,006,838** | **2,033,905** | **2,061,328** | **2,089,109** | **1,846,616** | **1,872,253** | **1,898,230** | **1,924,552** | **1,951,223** | **1,978,247** | **2,005,629** | **2,033,279** | **2,061,002** | **2,089,083** | **1,989,635** | **2,016,645** | **2,044,000** | **2,071,706** | **2,099,766** | **2,128,184** | **2,156,965** | **2,185,965** |

**Regional WwTP Load - Growth Scenario 1**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load from Route 9C | | | | | | | | | | | | | | | 179,698 | 183,423 | 187,236 | 191,137 | 194,749 | 198,433 | 202,190 | 206,023 | 209,933 | 213,922 | 217,991 | 222,142 | 226,377 | 230,698 | 235,107 | 239,605 | 244,195 | 248,879 | 253,659 | 258,521 | 263,483 | 268,547 | 273,716 | 278,991 | 284,375 | 289,870 | 295,480 | 301,206 | 307,052 |
| Load from North Fringe Sewer | | | | | | | | | | | | | | | | | | | | 151,519 | 153,675 | 155,863 | 158,083 | 160,336 | 162,622 | 164,941 | 167,295 | 169,683 | 172,107 | 174,567 | 177,063 | 179,595 | 182,165 | 184,758 | 187,388 | 190,058 | 192,766 | 195,515 | 198,304 | 201,134 | 204,006 | 206,920 | 209,878 |
| Load from NDDS Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | 270,636 | 273,512 | 276,418 | 279,356 | 282,326 | 285,329 | 288,364 | 291,432 | 294,500 | 297,601 | 300,735 | 303,902 | 307,104 | 310,340 | 313,610 | 316,916 | 320,257 | 323,634 |
| Load from Route 9B Sewer (Lucan/Clondalkin) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 127,893 | 129,697 | 131,525 | 133,380 | 135,260 | 137,168 | 139,102 | 141,063 |
| **Cumulative Load on Regional WwTP** | | | | | | | | | | | | | | | **179,698** | **183,423** | **187,236** | **191,137** | **194,749** | **349,952** | **355,865** | **361,886** | **368,016** | **374,257** | **380,612** | **657,720** | **667,184** | **676,800** | **686,570** | **696,498** | **706,586** | **716,838** | **727,256** | **737,779** | **748,472** | **887,233** | **900,081** | **913,135** | **926,398** | **939,875** | **953,570** | **967,485** | **981,627** |

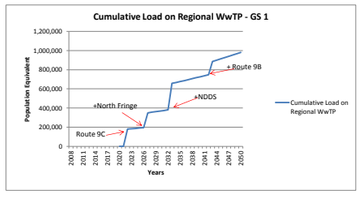
**Ringsend WwTP - Summary for Growth Scenario 1**

| | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Load on Ringsend WwTP following Diversions** | | | | 1,740,000 | 1,770,534 | 1,801,773 | 1,833,737 | 1,866,450 | 1,899,935 | 1,934,217 | 1,969,322 | 2,005,276 | 2,042,106 | 2,079,842 | 1,938,814 | 1,974,724 | 2,011,545 | 2,049,325 | 2,077,112 | 1,953,748 | 1,980,120 | 2,006,838 | 2,033,905 | 2,061,328 | 2,089,109 | 1,846,616 | 1,872,253 | 1,898,230 | 1,924,552 | 1,951,223 | 1,978,247 | 2,005,629 | 2,033,279 | 2,061,002 | 2,089,083 | 1,989,635 | 2,016,645 | 2,044,000 | 2,071,706 | 2,099,766 | 2,128,184 | 2,156,965 | 2,185,965 |
| Ringsend WwTP Treatment Capacity | | | | 1,640,000 | 1,640,000 | 1,640,000 | 1,640,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 |




**Regional WwTP - Load Profile under Growth Scenario 1**

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cumulative Load on Regional WwTP | | | | | | | | | | | | | | 0 | 0 | 179,698 | 183,423 | 187,236 | 191,137 | 194,749 | 349,952 | 355,865 | 361,886 | 368,016 | 374,257 | 380,612 | 657,720 | 667,184 | 676,800 | 686,570 | 696,498 | 706,586 | 716,838 | 727,256 | 737,779 | 748,472 | 887,233 | 900,081 | 913,135 | 926,398 | 939,875 | 953,570 | 967,485 | 981,627 |
| | | | | | | | | Route 9C | | | | | | | | | | | | | + North Fringe | | | | | | + NDDS | | | | | | | | | | | | + Route 9B | | | | | | | |



**Potential for Diversion of Load from Ringsend Wwtp and Potential Load on Proposed Regional WwTP - Growth Scenario 2**

**Growth Scenario 2 - Diversion of Loads from Ringsend WwTP**

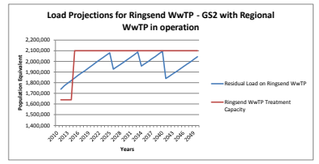
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Projected Load on Ringsend WwTP** | **1,790,678** | **0** | **0** | **1,740,000** | **1,770,223** | **1,794,652** | **1,819,418** | **1,844,526** | **1,869,981** | **1,892,794** | **1,915,887** | **1,939,260** | **1,962,919** | **1,986,867** | **2,011,107** | **2,034,234** | **2,057,628** | **2,081,291** | **2,105,226** | **2,129,436** | **2,153,924** | **2,178,694** | **2,203,749** | **2,229,093** | **2,254,727** | **2,280,656** | **2,306,884** | **2,333,413** | **2,360,247** | **2,387,390** | **2,414,846** | **2,442,616** | **2,470,706** | **2,499,119** | **2,527,859** | **2,556,929** | **2,586,334** | **2,616,077** | **2,646,162** | **2,676,593** | **2,707,374** | **2,738,508** | **2,770,001** |
| Projected Load on Route 9C Sewer | | | | 143,854 | 146,579 | 149,353 | 152,182 | 155,067 | 158,010 | 160,134 | 162,289 | 164,475 | 166,693 | 168,943 | 171,225 | 173,194 | 175,186 | 177,201 | 179,238 | 181,300 | 183,385 | 185,494 | 187,627 | 189,784 | 191,967 | 194,175 | 196,408 | 198,666 | 200,951 | 203,262 | 205,599 | 207,964 | 210,355 | 212,774 | 215,221 | 217,696 | 220,200 | 222,732 | 225,294 | 227,884 | 230,505 | 233,156 | 235,837 |
| **Residual Load on Ringsend WwTP following diversion of Route 9C** | | | | | | | | | | | | | **1,796,226** | **1,817,924** | **1,839,882** | **1,861,040** | **1,882,442** | **1,904,090** | **1,925,987** | **1,948,136** | **1,970,540** | **1,993,201** | **2,016,123** | **2,039,308** | **2,062,760** | **2,086,482** | **2,110,477** | **2,134,747** | **2,159,297** | **2,184,128** | **2,209,246** | **2,234,652** | **2,260,351** | **2,286,345** | **2,312,638** | **2,339,233** | **2,366,134** | **2,393,345** | **2,420,868** | **2,448,708** | **2,476,868** | **2,505,352** | **2,534,164** |
| Projected load on North Fringe Sewer | | | | 117,884 | 119,465 | 121,033 | 122,624 | 124,236 | 125,871 | 127,428 | 129,004 | 130,599 | 132,214 | 133,849 | 135,505 | 137,063 | 138,639 | 140,234 | 141,846 | 143,477 | 145,127 | 146,796 | 148,485 | 150,192 | 151,919 | 153,666 | 155,434 | 157,221 | 159,029 | 160,858 | 162,708 | 164,579 | 166,472 | 168,386 | 170,322 | 172,281 | 174,262 | 176,266 | 178,294 | 180,344 | 182,418 | 184,516 | 186,638 |
| **Residual Load on Ringsend WwTP following diversion of North Fringe Sewer** | | | | | | | | | | | | | **1,664,012** | **1,684,075** | **1,704,377** | **1,723,977** | **1,743,803** | **1,763,857** | **1,784,141** | **1,804,659** | **1,825,412** | **1,846,405** | **1,867,638** | **1,889,116** | **1,910,841** | **1,932,816** | **1,955,043** | **1,977,526** | **2,000,267** | **2,023,271** | **2,046,538** | **2,070,073** | **2,093,879** | **2,117,959** | **2,142,315** | **2,166,952** | **2,191,872** | **2,217,078** | **2,242,575** | **2,268,364** | **2,294,451** | **2,320,837** | **2,347,526** |
| Project Load on NDDS Sewer | | | | | | | | | | | | | 225,728 | 227,985 | 230,265 | 232,567 | 234,893 | 237,242 | 239,614 | 242,011 | 244,431 | 246,875 | 249,344 | 251,837 | 254,356 | 256,899 | 259,468 | 262,063 | 264,683 | 267,330 | 270,003 | 272,704 | 275,431 | 278,185 | 280,967 | 283,776 | 286,614 | 289,480 | 292,375 | 295,299 | 298,252 | 301,234 | 304,247 |
| **Balance (Residual Load on Ringsend WwTP) - Unadjusted** | | | | **1,740,000** | **1,770,223** | **1,794,652** | **1,819,418** | **1,844,526** | **1,869,981** | **1,892,794** | **1,915,887** | **1,939,260** | **1,962,919** | **1,986,867** | **2,011,107** | **2,034,234** | **2,057,628** | **2,081,291** | **1,925,987** | **1,948,136** | **1,970,540** | **1,993,201** | **2,016,123** | **2,039,308** | **2,062,760** | **2,086,482** | **1,955,043** | **1,977,526** | **2,000,267** | **2,023,271** | **2,046,538** | **2,070,073** | **2,093,879** | **1,839,774** | **1,861,349** | **1,883,176** | **1,905,258** | **1,927,598** | **1,950,200** | **1,973,066** | **1,996,199** | **2,019,602** | **2,043,280** |
| | | | | | | | | | | | | | | | | | | | Route 9C | | | | | | | | + NFS | | | | | | + NDDS | | | | | | | | | | |
| **Balance (Residual Load on Ringsend WwTP) - Proposed Load Profile** | | | | **1,740,000** | **1,770,223** | **1,794,652** | **1,819,418** | **1,844,526** | **1,869,981** | **1,892,794** | **1,915,887** | **1,939,260** | **1,664,012** | **1,684,075** | **1,704,377** | **1,723,977** | **1,743,803** | **1,763,857** | **1,784,141** | **1,804,659** | **1,825,412** | **1,846,405** | **1,867,638** | **1,889,116** | **1,910,841** | **1,932,816** | **1,955,043** | **1,715,463** | **1,735,584** | **1,755,940** | **1,776,535** | **1,797,370** | **1,818,449** | **1,839,774** | **1,861,349** | **1,883,176** | **1,905,258** | **1,927,598** | **1,950,200** | **1,973,066** | **1,996,199** | **2,019,602** | **2,043,280** |
| | | | | | | | | | | | | | Route 9C + NFS | | | | | | | | | | | | | | | NDDS | | | | | | | | | | | | | | | | |

**Regional WwTP Load - Growth Scenario 2 (Unadjusted)**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load from Route 9C | | | | | | | | | | | | | | | | | | | 179,238 | 181,300 | 183,385 | 185,494 | 187,627 | 189,784 | 191,967 | 194,175 | 196,408 | 198,666 | 200,951 | 203,262 | 205,599 | 207,964 | 210,355 | 212,774 | 215,221 | 217,696 | 220,200 | 222,732 | 225,294 | 227,884 | 230,505 | 233,156 | 235,837 |
| Load from North Fringe Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | | 155,434 | 157,221 | 159,029 | 160,858 | 162,708 | 164,579 | 166,472 | 168,386 | 170,322 | 172,281 | 174,262 | 176,266 | 178,294 | 180,344 | 182,418 | 184,516 | 186,638 |
| Load from NDDS Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 278,185 | 280,967 | 283,776 | 286,614 | 289,480 | 292,375 | 295,299 | 298,252 | 301,234 | 304,247 |
| Load from Route 9B Sewer (Lucan/Clondalkin) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Cumulative Load on Regional WwTP** | | | | | | | | | | | | | | | | | | | **179,238** | **181,300** | **183,385** | **185,494** | **187,627** | **189,784** | **191,967** | **194,175** | **351,841** | **355,887** | **359,980** | **364,120** | **368,307** | **372,543** | **376,827** | **659,345** | **666,511** | **673,754** | **681,076** | **688,479** | **695,962** | **703,527** | **711,175** | **718,906** | **726,721** |
| | | | | | | | | | | | | | | | | | | | Route 9C | | | | | | | | +NFS | | | | | | + NDDS | | | | | | | | | | |

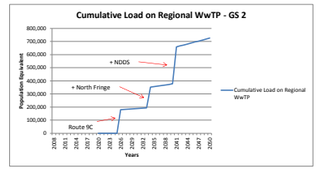
**Ringsend WwTP - Summary for Growth Scenario 2**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Residual Load on Ringsend WwTP** | | 1,740,000 | 1,770,223 | 1,794,652 | 1,819,418 | 1,844,526 | 1,869,981 | 1,892,794 | 1,915,887 | 1,939,260 | 1,962,919 | 1,986,867 | 2,011,107 | 2,034,234 | 2,057,628 | 2,081,291 | 1,925,987 | 1,948,136 | 1,970,540 | 1,993,201 | 2,016,123 | 2,039,308 | 2,062,760 | 2,086,482 | 1,955,043 | 1,977,526 | 2,000,267 | 2,023,271 | 2,046,538 | 2,070,073 | 2,093,879 | 1,839,774 | 1,861,349 | 1,883,176 | 1,905,258 | 1,927,598 | 1,950,200 | 1,973,066 | 1,996,199 | 2,019,602 | 2,043,280 |
| Ringsend WwTP Treatment Capacity | | 1,640,000 | 1,640,000 | 1,640,000 | 1,640,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 |




**Regional WwTP - Load Profile under Growth Scenario 2 (Unadjusted)**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cumulative Load on Regional WwTP | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 179,238 | 181,300 | 183,385 | 185,494 | 187,627 | 189,784 | 191,967 | 194,175 | 351,841 | 355,887 | 359,980 | 364,120 | 368,307 | 372,543 | 376,827 | 659,345 | 666,511 | 673,754 | 681,076 | 688,479 | 695,962 | 703,527 | 711,175 | 718,906 | 726,721 |
| | | | | | | | | | | | | | | | | | | | Route 9C | | | | | | | | +NFS | | | | | | + NDDS | | | | | | | | | | |

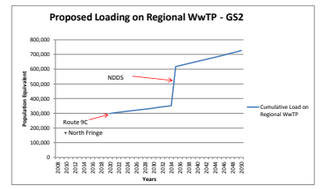



**Regional WwTP Load - Growth Scenario 2 (Proposed Load Profile)**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load from Route 9C | | | | | | | | | | | | | 166,693 | 168,943 | 171,225 | 173,194 | 175,186 | 177,201 | 179,238 | 181,300 | 183,385 | 185,494 | 187,627 | 189,784 | 191,967 | 194,175 | 196,408 | 198,666 | 200,951 | 203,262 | 205,599 | 207,964 | 210,355 | 212,774 | 215,221 | 217,696 | 220,200 | 222,732 | 225,294 | 227,884 | 230,505 | 233,156 | 235,837 |
| Load from North Fringe Sewer | | | | | | | | | | | | | 132,214 | 133,849 | 135,505 | 137,063 | 138,639 | 140,234 | 141,846 | 143,477 | 145,127 | 146,796 | 148,485 | 150,192 | 151,919 | 153,666 | 155,434 | 157,221 | 159,029 | 160,858 | 162,708 | 164,579 | 166,472 | 168,386 | 170,322 | 172,281 | 174,262 | 176,266 | 178,294 | 180,344 | 182,418 | 184,516 | 186,638 |
| Load from NDDS Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | | | 262,063 | 264,683 | 267,330 | 270,003 | 272,704 | 275,431 | 278,185 | 280,967 | 283,776 | 286,614 | 289,480 | 292,375 | 295,299 | 298,252 | 301,234 | 304,247 |
| Load from Route 9B Sewer (Lucan/Clondalkin) | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Cumulative Load on Regional WwTP** | | | | | | | | | | | | | **298,907** | **302,792** | **306,730** | **310,257** | **313,825** | **317,434** | **321,085** | **324,777** | **328,512** | **332,290** | **336,111** | **339,977** | **343,886** | **347,841** | **351,841** | **617,950** | **624,663** | **631,450** | **638,311** | **645,246** | **652,257** | **659,345** | **666,511** | **673,754** | **681,076** | **688,479** | **695,962** | **703,527** | **711,175** | **718,906** | **726,721** |

**Ringsend WwTP - Summary for Growth Scenario 2**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Residual Load on Ringsend WwTP** | | 1,740,000 | 1,770,223 | 1,794,652 | 1,819,418 | 1,844,526 | 1,869,981 | 1,892,794 | 1,915,887 | 1,939,260 | 1,664,012 | 1,684,075 | 1,704,377 | 1,723,977 | 1,743,803 | 1,763,857 | 1,784,141 | 1,804,659 | 1,825,412 | 1,846,405 | 1,867,638 | 1,889,116 | 1,910,841 | 1,932,816 | 1,955,043 | 1,715,463 | 1,735,584 | 1,755,940 | 1,776,535 | 1,797,370 | 1,818,449 | 1,839,774 | 1,861,349 | 1,883,176 | 1,905,258 | 1,927,598 | 1,950,200 | 1,973,066 | 1,996,199 | 2,019,602 | 2,043,280 |
| Ringsend WwTP Treatment Capacity | | 1,640,000 | 1,640,000 | 1,640,000 | 1,640,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 |




**Regional WwTP - Proposed Load Profile under Growth Scenario 2**

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cumulative Load on Regional WwTP | | | | | | | | | | | | | | 298,907 | 302,730 | 310,257 | 313,825 | 317,434 | 321,085 | 324,777 | 328,512 | 332,290 | 336,111 | 339,977 | 343,886 | 347,841 | 351,841 | 617,950 | 624,663 | 631,450 | 638,311 | 645,246 | 652,257 | 659,345 | 666,511 | 673,754 | 681,076 | 688,479 | 695,962 | 703,527 | 711,175 | 718,906 | 726,721 |
| | | | | | | | | | | | | | | Route 9C & NFS Proposed Diversion | | | | | | | | | | | | | | | NDDS Proposed Diversion | | | | | | | | | | | | | | | | | |

**Potential for Diversion of Load from Ringsend Wwtp and Potential Load on Proposed Regional WwTP**

**Growth Scenario 3 - Diversion of Loads from Ringsend WwTP**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Projected Load on Ringsend WwTP** | **1,790,678** | **0** | **0** | **1,740,000** | **1,762,510** | **1,785,320** | **1,808,435** | **1,831,857** | **1,855,593** | **1,869,408** | **1,883,353** | **1,897,428** | **1,911,635** | **1,925,975** | **1,940,449** | **1,955,059** | **1,969,807** | **1,984,692** | **1,999,717** | **2,014,884** | **2,030,192** | **2,045,645** | **2,061,243** | **2,076,987** | **2,092,879** | **2,108,921** | **2,125,114** | **2,141,459** | **2,157,958** | **2,174,612** | **2,191,423** | **2,208,391** | **2,225,523** | **2,242,814** | **2,260,266** | **2,277,887** | **2,295,672** | **2,313,625** | **2,331,748** | **2,350,042** | **2,368,508** | **2,387,149** | **2,405,967** |
| Projected Load on Route 9C Sewer | | | | 143,854 | 146,489 | 149,175 | 151,914 | 154,707 | 157,554 | 159,107 | 160,675 | 162,258 | 163,857 | 165,472 | 167,102 | 168,749 | 170,412 | 172,092 | 173,788 | 175,501 | 177,232 | 178,979 | 180,743 | 182,525 | 184,325 | 186,142 | 187,977 | 189,831 | 191,703 | 193,593 | 195,502 | 197,430 | 199,377 | 201,344 | 203,330 | 205,335 | 207,361 | 209,406 | 211,472 | 213,558 | 215,665 | 217,793 | 219,941 |
| **Balance of Load on Ringsend WwTP following diversion of Route 9C** | | | | | | | | | | | | | | | | | | | | | | | | | | **1,922,779** | **1,937,136** | **1,951,628** | **1,966,255** | **1,981,019** | **1,995,921** | **2,010,963** | **2,026,145** | **2,041,470** | **2,056,938** | **2,072,552** | **2,088,311** | **2,104,219** | **2,120,276** | **2,136,483** | **2,152,843** | **2,169,357** | **2,186,025** |
| Projected Load on North Fringe Sewer | | | | 117,884 | 119,379 | 120,894 | 122,431 | 123,988 | 125,567 | 126,799 | 128,043 | 129,299 | 130,568 | 131,849 | 133,143 | 134,450 | 135,769 | 137,102 | 138,447 | 139,806 | 141,179 | 142,565 | 143,964 | 145,378 | 146,805 | 148,247 | 149,702 | 151,173 | 152,657 | 154,156 | 155,670 | 157,199 | 158,743 | 160,303 | 161,878 | 163,468 | 165,074 | 166,695 | 168,334 | 169,988 | 171,658 | 173,345 | 175,048 |
| **Balance of Load on Ringsend WwTP following diversion of North Fringe Sewer** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1,881,167** | **1,895,061** | **1,909,084** | **1,923,238** | **1,937,523** | **1,951,942** | **1,966,496** | **1,981,185** | **1,996,012** | **2,010,977** |
| Projected Load on NDDS Sewer | | | | | | | | | | | | | 225,728 | 227,985 | 230,265 | 232,567 | 234,893 | 237,242 | 239,614 | 242,011 | 244,431 | 246,875 | 249,344 | 251,837 | 254,356 | 256,899 | 259,468 | 262,063 | 264,683 | 267,330 | 270,003 | 272,704 | 275,431 | 278,185 | 280,967 | 283,776 | 286,614 | 289,480 | 292,375 | 295,299 | 298,252 | 301,234 | 304,247 |
| **Balance (Residual Load on Ringsend WwTP)** | | | | **1,740,000** | **1,762,510** | **1,785,320** | **1,808,435** | **1,831,857** | **1,855,593** | **1,869,408** | **1,883,353** | **1,897,428** | **1,911,635** | **1,925,975** | **1,940,449** | **1,955,059** | **1,969,807** | **1,984,692** | **1,999,717** | **2,014,884** | **2,030,192** | **2,045,645** | **2,061,243** | **2,076,987** | **2,092,879** | **1,922,779** | **1,937,136** | **1,951,628** | **1,966,255** | **1,981,019** | **1,995,921** | **2,010,963** | **2,026,145** | **2,041,470** | **2,056,938** | **2,072,552** | **2,088,311** | **1,937,523** | **1,951,942** | **1,966,496** | **1,981,185** | **1,996,012** | **2,010,977** |

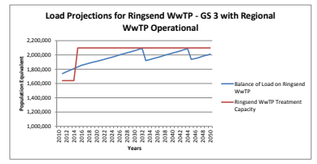
Under this scenario the NDDS does not have to be diverted before 2050

**Regional WwTP Load from Ringsend Catchment - Growth Scenario 3**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Load from Route 9C | | | | | | | | | | | | | | | | | | | | | | | | | | 186,142 | 187,977 | 189,831 | 191,703 | 193,593 | 195,502 | 197,430 | 199,377 | 201,344 | 203,330 | 205,335 | 207,361 | 209,406 | 211,472 | 213,558 | 215,665 | 217,793 | 219,941 |
| Load from North Fringe Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 166,696 | 168,334 | 169,988 | 171,658 | 173,345 | 175,048 |
| Load from NDDS Sewer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 |
| Load from Route 9B Sewer (Lucan/Clondalkin) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 |
| **Cumulative Load on Regional WwTP** | | | | | | | | | | | | | | | | | | | | | | | | | | **186,142** | **187,977** | **189,831** | **191,703** | **193,593** | **195,502** | **197,430** | **199,377** | **201,344** | **203,330** | **205,335** | **207,361** | **376,102** | **379,805** | **383,546** | **387,323** | **391,138** | **394,990** |

**Ringsend WwTP - Summary for Growth Scenario 3 with Diversions to Regional WwTP**

| | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Balance of Load on Ringsend WwTP** | | | | 1,740,000 | 1,762,510 | 1,785,320 | 1,808,435 | 1,831,857 | 1,855,593 | 1,869,408 | 1,883,353 | 1,897,428 | 1,911,635 | 1,925,975 | 1,940,449 | 1,955,059 | 1,969,807 | 1,984,692 | 1,999,717 | 2,014,884 | 2,030,192 | 2,045,645 | 2,061,243 | 2,076,987 | 2,092,879 | 1,922,779 | 1,937,136 | 1,951,628 | 1,966,255 | 1,981,019 | 1,995,921 | 2,010,963 | 2,026,145 | 2,041,470 | 2,056,938 | 2,072,552 | 2,088,311 | 1,937,523 | 1,951,942 | 1,966,496 | 1,981,185 | 1,996,012 | 2,010,977 |
| Ringsend WwTP Treatment Capacity | | | | 1,640,000 | 1,640,000 | 1,640,000 | 1,640,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 |




**Regional WwTP - Load Profile under Growth Scenario 3 from Ringsend Catchment**

| | | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cumulative Load on Regional WwTP | | | | | | | | | | | | | | | | | | | | | | | | | | | 186,142 | 187,977 | 189,831 | 191,703 | 193,593 | 195,502 | 197,430 | 199,377 | 201,344 | 203,330 | 205,335 | 207,361 | 376,102 | 379,805 | 383,546 | 387,323 | 391,138 | 394,990 |

Route 9C

+ North Fringe

**Ringsend WwTP**

| Growth Rates (Scenario 1) | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ringsend WwTP** | 1.38% (2006 - 2050); | **Population** | 1,066,311 | | | 1,098,470 | 1,113,629 | 1,128,997 | 1,144,577 | 1,160,372 | 1,176,385 | 1,192,620 | 1,209,078 | 1,225,763 | 1,242,678 | 1,259,827 | 1,277,213 | 1,294,839 | 1,312,707 | 1,330,823 | 1,349,188 | 1,367,807 | 1,386,683 | 1,405,819 | 1,425,219 | 1,444,887 | 1,464,827 | 1,485,041 | 1,505,535 | 1,526,311 | 1,547,374 | 1,568,728 | 1,590,376 | 1,612,324 | 1,634,574 | 1,657,131 | 1,679,999 | 1,703,183 | 1,726,687 | 1,750,515 | 1,774,673 | 1,799,163 | 1,823,992 | 1,849,163 | 1,874,681 |
| | 1.38% (2006 - 2050; | **Commercial** | 490,514 | | | 420,660 | 426,465 | 432,350 | 438,317 | 444,366 | 450,498 | 456,715 | 463,017 | 469,407 | 475,885 | 482,452 | 489,110 | 495,860 | 502,702 | 509,640 | 516,673 | 523,803 | 531,031 | 538,360 | 545,789 | 553,321 | 560,957 | 568,698 | 576,546 | 584,502 | 592,568 | 600,746 | 609,036 | 617,441 | 625,961 | 634,600 | 643,357 | 652,235 | 661,236 | 670,361 | 679,612 | 688,991 | 698,499 | 708,138 | 717,911 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 233,853 | | | 220,870 | 230,440 | 240,425 | 250,843 | 261,712 | 273,052 | 284,883 | 297,227 | 310,106 | 323,543 | 337,562 | 352,189 | 367,449 | 383,371 | 400,000 | 406,000 | 412,090 | 418,271 | 424,545 | 430,914 | 437,377 | 443,938 | 450,597 | 457,356 | 464,216 | 471,180 | 478,247 | 485,421 | 492,702 | 500,000 | 507,050 | 514,199 | 521,450 | 528,802 | 536,258 | 543,819 | 551,487 | 559,263 | 567,149 | 575,000 |
| | | **Total** | **1,790,678** | | | **1,740,000** | **1,770,534** | **1,801,773** | **1,833,737** | **1,866,450** | **1,899,935** | **1,934,217** | **1,969,322** | **2,005,276** | **2,042,106** | **2,079,842** | **2,118,512** | **2,158,147** | **2,198,780** | **2,240,462** | **2,271,861** | **2,303,700** | **2,335,985** | **2,368,724** | **2,401,922** | **2,435,585** | **2,469,721** | **2,504,336** | **2,539,437** | **2,575,030** | **2,611,122** | **2,647,721** | **2,684,833** | **2,722,467** | **2,760,535** | **2,798,781** | **2,837,556** | **2,876,868** | **2,916,726** | **2,957,135** | **2,998,104** | **3,039,641** | **3,081,754** | **3,124,450** | **3,167,592** |

*Note: Commercial + Industrial Load = 37% of total load at 2011. Growth Scenario 1 grows this to 41% at 2050.*

| Growth Rates (Scenario 2) | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ringsend WwTP** | 1.38% (2006 - 2016); 1.22% (2017 - 2022); 1.15% (post 2022) | **Population** | 1,066,311 | | | 1,098,470 | 1,113,629 | 1,128,997 | 1,144,577 | 1,160,372 | 1,176,385 | 1,190,737 | 1,205,264 | 1,219,969 | 1,234,852 | 1,249,917 | 1,265,166 | 1,279,716 | 1,294,432 | 1,309,318 | 1,324,376 | 1,339,606 | 1,355,011 | 1,370,594 | 1,386,356 | 1,402,299 | 1,418,425 | 1,434,737 | 1,451,237 | 1,467,926 | 1,484,807 | 1,501,882 | 1,519,154 | 1,536,624 | 1,554,296 | 1,572,170 | 1,590,250 | 1,608,538 | 1,627,036 | 1,645,747 | 1,664,673 | 1,683,817 | 1,703,181 | 1,722,767 | 1,742,579 |
| | 1.38% (2006 - 2016); 1.22% (2017 - 2022); 1.15% (post 2022) | **Commercial** | 490,514 | | | 420,660 | 426,465 | 432,350 | 438,317 | 444,366 | 450,498 | 455,994 | 461,557 | 467,188 | 472,888 | 478,657 | 484,497 | 490,068 | 495,704 | 501,405 | 507,171 | 513,003 | 518,903 | 524,870 | 530,906 | 537,012 | 543,187 | 549,434 | 555,752 | 562,143 | 568,608 | 575,147 | 581,761 | 588,452 | 595,219 | 602,064 | 608,988 | 615,991 | 623,075 | 630,240 | 637,488 | 644,819 | 652,234 | 659,735 | 667,322 |
| | Maintain Industrial load at same percentage of total load throughout | **Industrial** | 233,853 | | | 220,870 | 230,129 | 233,305 | 236,524 | 239,788 | 243,097 | 246,063 | 249,065 | 252,104 | 255,180 | 258,293 | 261,444 | 264,450 | 267,492 | 270,568 | 273,679 | 276,827 | 280,010 | 283,230 | 286,487 | 289,782 | 293,115 | 296,485 | 299,895 | 303,344 | 306,832 | 310,361 | 313,930 | 317,540 | 321,192 | 324,885 | 328,622 | 332,401 | 336,223 | 340,090 | 344,001 | 347,957 | 351,959 | 356,006 | 360,100 |
| | | **Total** | **1,790,678** | | | **1,740,000** | **1,770,223** | **1,794,652** | **1,819,418** | **1,844,526** | **1,869,981** | **1,892,794** | **1,915,887** | **1,939,260** | **1,962,919** | **1,986,867** | **2,011,107** | **2,034,234** | **2,057,628** | **2,081,291** | **2,105,226** | **2,129,436** | **2,153,924** | **2,178,694** | **2,203,749** | **2,229,093** | **2,254,727** | **2,280,656** | **2,306,884** | **2,333,413** | **2,360,247** | **2,387,390** | **2,414,845** | **2,442,616** | **2,470,706** | **2,499,119** | **2,527,859** | **2,556,929** | **2,586,334** | **2,616,077** | **2,646,162** | **2,676,593** | **2,707,374** | **2,738,508** | **2,770,001** |

*Commercial + Industrial Load = 37% of total load at 2011. Growth Scenario 2 maintains this overall percentage of total load at 37% to 2050.*

| Growth Rates (Scenario 3) | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ringsend WwTP** | 1.38% (2006 - 2016); 1.00% (post 2016); | **Population** | 1,066,311 | | | 1,098,470 | 1,113,629 | 1,128,997 | 1,144,577 | 1,160,372 | 1,176,385 | 1,188,149 | 1,200,031 | 1,212,031 | 1,224,151 | 1,236,393 | 1,248,757 | 1,261,244 | 1,273,857 | 1,286,595 | 1,299,461 | 1,312,456 | 1,325,581 | 1,338,836 | 1,352,225 | 1,365,747 | 1,379,404 | 1,393,198 | 1,407,130 | 1,421,202 | 1,435,414 | 1,449,768 | 1,464,266 | 1,478,908 | 1,493,697 | 1,508,634 | 1,523,721 | 1,538,958 | 1,554,347 | 1,569,891 | 1,585,590 | 1,601,446 | 1,617,460 | 1,633,635 | 1,649,971 |
| | 1.38% (2006 - 2016); 1.00% (post 2016); | **Commercial** | 490,514 | | | 420,660 | 426,465 | 432,350 | 438,317 | 444,366 | 450,498 | 450,948 | 451,399 | 451,851 | 452,302 | 452,755 | 453,208 | 453,661 | 454,114 | 454,569 | 455,023 | 455,478 | 455,934 | 456,390 | 456,846 | 457,303 | 457,760 | 458,218 | 458,676 | 459,135 | 459,594 | 460,053 | 460,513 | 460,974 | 461,435 | 461,896 | 462,358 | 462,821 | 463,283 | 463,747 | 464,211 | 464,675 | 465,139 | 465,605 | 466,070 |
| | Industrial Load to grow at 0.70% per annum | **Industrial** | 233,853 | | | 220,870 | 222,416 | 223,973 | 225,541 | 227,120 | 228,709 | 230,310 | 231,923 | 233,546 | 235,181 | 236,827 | 238,485 | 240,154 | 241,835 | 243,528 | 245,233 | 246,950 | 248,678 | 250,419 | 252,172 | 253,937 | 255,715 | 257,505 | 259,307 | 261,122 | 262,950 | 264,791 | 266,644 | 268,511 | 270,390 | 272,283 | 274,189 | 276,109 | 278,041 | 279,988 | 281,947 | 283,921 | 285,909 | 287,910 | 289,925 |
| | | **Total** | **1,790,678** | | | **1,740,000** | **1,762,510** | **1,785,320** | **1,808,435** | **1,831,857** | **1,855,593** | **1,869,408** | **1,883,353** | **1,897,428** | **1,911,635** | **1,925,975** | **1,940,449** | **1,955,059** | **1,969,807** | **1,984,692** | **1,999,717** | **2,014,884** | **2,030,192** | **2,045,645** | **2,061,243** | **2,076,987** | **2,092,879** | **2,108,921** | **2,125,114** | **2,141,459** | **2,157,958** | **2,174,612** | **2,191,423** | **2,208,393** | **2,225,523** | **2,242,814** | **2,260,268** | **2,277,887** | **2,295,672** | **2,313,625** | **2,331,748** | **2,350,042** | **2,368,508** | **2,387,149** | **2,405,967** |

*Commercial + Industrial Load = 37% of total load at 2011. Growth Scenario 3 decreases the overall percentage of total load linearly to 31.5% at 2050.*

**Ringsend WwTP Summary**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Growth Scenario 1 | 1,740,000 | 1,770,534 | 1,801,773 | 1,833,737 | 1,866,450 | 1,899,935 | 1,934,217 | 1,969,322 | 2,005,276 | 2,042,106 | 2,079,842 | 2,118,512 | 2,158,147 | 2,198,780 | 2,240,462 | 2,271,861 | 2,303,700 | 2,335,985 | 2,368,724 | 2,401,922 | 2,435,585 | 2,469,721 | 2,504,336 | 2,539,437 | 2,575,030 | 2,611,122 | 2,647,721 | 2,684,833 | 2,722,467 | 2,760,535 | 2,798,781 | 2,837,556 | 2,876,868 | 2,916,726 | 2,957,135 | 2,998,104 | 3,039,641 | 3,081,754 | 3,124,450 | 3,167,592 |
| Growth Scenario 2 | 1,740,000 | 1,770,223 | 1,794,652 | 1,819,418 | 1,844,526 | 1,869,981 | 1,892,794 | 1,915,887 | 1,939,260 | 1,962,919 | 1,986,867 | 2,011,107 | 2,034,234 | 2,057,628 | 2,081,291 | 2,105,226 | 2,129,436 | 2,153,924 | 2,178,694 | 2,203,749 | 2,229,093 | 2,254,727 | 2,280,656 | 2,306,884 | 2,333,413 | 2,360,247 | 2,387,390 | 2,414,845 | 2,442,616 | 2,470,706 | 2,499,119 | 2,527,859 | 2,556,929 | 2,586,334 | 2,616,077 | 2,646,162 | 2,676,593 | 2,707,374 | 2,738,508 | 2,770,001 |
| Growth Scenario 3 | 1,740,000 | 1,762,510 | 1,785,320 | 1,808,435 | 1,831,857 | 1,855,593 | 1,869,408 | 1,883,353 | 1,897,428 | 1,911,635 | 1,925,975 | 1,940,449 | 1,955,059 | 1,969,807 | 1,984,692 | 1,999,717 | 2,014,884 | 2,030,192 | 2,045,645 | 2,061,243 | 2,076,987 | 2,092,879 | 2,108,921 | 2,125,114 | 2,141,459 | 2,157,958 | 2,174,612 | 2,191,423 | 2,208,393 | 2,225,523 | 2,242,814 | 2,260,268 | 2,277,887 | 2,295,672 | 2,313,625 | 2,331,748 | 2,350,042 | 2,368,508 | 2,387,149 | 2,405,967 |
| Treatment Capacity | 1,640,000 | 1,640,000 | 1,640,000 | 1,640,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 | 2,100,000 |

**Route 9C Sewer**

| Route 9C Sewer | Growth Rate (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blanchardstown (upstream of M50)** | 1.79% (2006 - 2050) | **Population** | 89,602 | 91,206 | 92,838 | 94,500 | 96,192 | 97,914 | 99,666 | 101,450 | 103,266 | 105,115 | 106,996 | 108,912 | 110,861 | 112,845 | 114,865 | 116,922 | 119,014 | 121,145 | 123,313 | 125,521 | 127,767 | 130,054 | 132,382 | 134,752 | 137,164 | 139,619 | 142,119 | 144,662 | 147,252 | 149,888 | 152,571 | 155,302 | 158,082 | 160,911 | 163,792 | 166,723 | 169,708 | 172,746 | 175,838 | 178,985 |
| | 16% of Residential Population; | **Commercial** | 14,336 | 14,593 | 14,854 | 15,120 | 15,391 | 15,666 | 15,947 | 16,232 | 16,523 | 16,818 | 17,119 | 17,426 | 17,738 | 18,055 | 18,378 | 18,707 | 19,042 | 19,383 | 19,730 | 20,083 | 20,443 | 20,809 | 21,181 | 21,560 | 21,946 | 22,339 | 22,739 | 23,146 | 23,560 | 23,982 | 24,411 | 24,848 | 25,293 | 25,746 | 26,207 | 26,676 | 27,153 | 27,639 | 28,134 | 28,638 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 6,450 | 6,729 | 7,021 | 7,325 | 7,643 | 7,974 | 8,319 | 8,680 | 9,056 | 9,448 | 9,858 | 10,285 | 10,731 | 11,195 | 11,681 | 11,856 | 12,034 | 12,214 | 12,397 | 12,583 | 12,772 | 12,964 | 13,158 | 13,355 | 13,556 | 13,759 | 13,965 | 14,175 | 14,388 | 14,603 | 14,809 | 15,018 | 15,230 | 15,445 | 15,662 | 15,883 | 16,107 | 16,334 | 16,565 | 16,798 |
| | | **Sub - Total** | **110,388** | **112,528** | **114,714** | **116,946** | **119,225** | **121,554** | **123,932** | **126,362** | **128,845** | **131,381** | **133,973** | **136,622** | **139,329** | **142,096** | **144,924** | **147,485** | **150,090** | **152,742** | **155,441** | **158,187** | **160,982** | **163,827** | **166,722** | **169,668** | **172,666** | **175,718** | **178,823** | **181,983** | **185,200** | **188,473** | **191,791** | **195,168** | **198,605** | **202,102** | **205,661** | **209,282** | **212,968** | **216,719** | **220,536** | **224,421** |
| **Meath** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ashbourne/Ratoath | 1.76% (2006 - 2050) | **Population** | 20,398 | 20,757 | 21,122 | 21,494 | 21,872 | 22,257 | 22,649 | 23,048 | 23,453 | 23,866 | 24,286 | 24,714 | 25,149 | 25,591 | 26,042 | 26,500 | 26,966 | 27,441 | 27,924 | 28,415 | 28,915 | 29,424 | 29,942 | 30,469 | 31,005 | 31,551 | 32,106 | 32,672 | 33,247 | 33,832 | 34,427 | 35,033 | 35,650 | 36,277 | 36,916 | 37,565 | 38,226 | 38,899 | 39,584 | 40,280 |
| | 16% of Residential Population | **Commercial** | 3,264 | 3,321 | 3,380 | 3,439 | 3,500 | 3,561 | 3,624 | 3,688 | 3,753 | 3,819 | 3,886 | 3,954 | 4,024 | 4,095 | 4,167 | 4,240 | 4,315 | 4,391 | 4,468 | 4,546 | 4,626 | 4,708 | 4,791 | 4,875 | 4,961 | 5,048 | 5,137 | 5,227 | 5,319 | 5,413 | 5,508 | 5,605 | 5,704 | 5,804 | 5,906 | 6,010 | 6,116 | 6,224 | 6,333 | 6,445 |
| Dunboyne/Clonee | 3.47% (2006 - 2050) | **Population** | 7,590 | 7,853 | 8,126 | 8,408 | 8,700 | 9,001 | 9,314 | 9,637 | 9,971 | 10,317 | 10,675 | 11,046 | 11,429 | 11,826 | 12,236 | 12,661 | 13,100 | 13,555 | 14,025 | 14,512 | 15,015 | 15,536 | 16,075 | 16,633 | 17,210 | 17,808 | 18,425 | 19,065 | 19,726 | 20,411 | 21,119 | 21,852 | 22,610 | 23,395 | 24,207 | 25,047 | 25,916 | 26,815 | 27,745 | 28,708 |
| | 16% of Residential Population | **Commercial** | 1,214 | 1,257 | 1,300 | 1,345 | 1,392 | 1,440 | 1,490 | 1,542 | 1,595 | 1,651 | 1,708 | 1,767 | 1,829 | 1,892 | 1,958 | 2,026 | 2,096 | 2,169 | 2,244 | 2,322 | 2,402 | 2,486 | 2,572 | 2,661 | 2,754 | 2,849 | 2,948 | 3,050 | 3,156 | 3,266 | 3,379 | 3,496 | 3,618 | 3,743 | 3,873 | 4,007 | 4,147 | 4,290 | 4,439 | 4,593 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 1,000 | 1,043 | 1,089 | 1,136 | 1,185 | 1,236 | 1,290 | 1,346 | 1,404 | 1,465 | 1,528 | 1,595 | 1,664 | 1,736 | 1,811 | 1,838 | 1,866 | 1,894 | 1,922 | 1,951 | 1,980 | 2,010 | 2,040 | 2,071 | 2,102 | 2,133 | 2,165 | 2,198 | 2,231 | 2,264 | 2,296 | 2,328 | 2,361 | 2,395 | 2,428 | 2,463 | 2,497 | 2,532 | 2,568 | 2,604 |
| | | **Sub - Total** | **33,466** | **34,231** | **35,016** | **35,822** | **36,648** | **37,496** | **38,367** | **39,260** | **40,177** | **41,118** | **42,084** | **43,076** | **44,094** | **45,139** | **46,213** | **47,264** | **48,343** | **49,448** | **50,583** | **51,746** | **52,940** | **54,164** | **55,420** | **56,709** | **58,032** | **59,389** | **60,782** | **62,212** | **63,679** | **65,185** | **66,730** | **68,315** | **69,943** | **71,614** | **73,330** | **75,092** | **76,902** | **78,761** | **80,670** | **82,631** |
| | **Total Route 9C** | | **143,854** | **146,760** | **149,730** | **152,768** | **155,874** | **159,050** | **162,299** | **165,622** | **169,022** | **172,499** | **176,057** | **179,698** | **183,423** | **187,236** | **191,137** | **194,749** | **198,433** | **202,190** | **206,023** | **209,933** | **213,922** | **217,991** | **222,142** | **226,377** | **230,698** | **235,107** | **239,605** | **244,195** | **248,879** | **253,659** | **258,521** | **263,483** | **268,547** | **273,716** | **278,991** | **284,375** | **289,870** | **295,480** | **301,206** | **307,052** |

| Route 9C Sewer | Growth Rate (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blanchardstown (upstream of M50)** | 1.79% (2006 - 2016); 1.27% (2017 - 2022); 1.15% (post 2022) | **Population** | 89,602 | 91,206 | 92,838 | 94,500 | 96,192 | 97,914 | 99,157 | 100,416 | 101,692 | 102,983 | 104,291 | 105,616 | 106,830 | 108,059 | 109,301 | 110,558 | 111,830 | 113,116 | 114,417 | 115,732 | 117,063 | 118,410 | 119,771 | 121,149 | 122,542 | 123,951 | 125,377 | 126,818 | 128,277 | 129,752 | 131,244 | 132,753 | 134,280 | 135,824 | 137,386 | 138,966 | 140,564 | 142,181 | 143,816 | 145,470 |
| | 16% of Res. Pop. | **Commercial** | 14,336 | 14,593 | 14,854 | 15,120 | 15,391 | 15,666 | 15,865 | 16,067 | 16,271 | 16,477 | 16,687 | 16,898 | 17,093 | 17,289 | 17,488 | 17,689 | 17,893 | 18,099 | 18,307 | 18,517 | 18,730 | 18,946 | 19,163 | 19,384 | 19,607 | 19,832 | 20,060 | 20,291 | 20,524 | 20,760 | 20,999 | 21,241 | 21,485 | 21,732 | 21,982 | 22,235 | 22,490 | 22,749 | 23,011 | 23,275 |
| | Maintain at same % of total load to 2050 | **Industrial** | 6,450 | 6,565 | 6,683 | 6,803 | 6,924 | 7,048 | 7,138 | 7,228 | 7,320 | 7,413 | 7,507 | 7,603 | 7,690 | 7,779 | 7,868 | 7,959 | 8,050 | 8,143 | 8,236 | 8,331 | 8,427 | 8,524 | 8,622 | 8,721 | 8,821 | 8,923 | 9,025 | 9,129 | 9,234 | 9,340 | 9,448 | 9,556 | 9,666 | 9,777 | 9,890 | 10,003 | 10,119 | 10,235 | 10,353 | 10,472 |
| | | **Sub - Total** | **110,388** | **112,364** | **114,376** | **116,423** | **118,507** | **120,628** | **122,160** | **123,712** | **125,283** | **126,874** | **128,485** | **130,117** | **131,613** | **133,127** | **134,658** | **136,206** | **137,773** | **139,357** | **140,960** | **142,581** | **144,220** | **145,879** | **147,556** | **149,253** | **150,970** | **152,706** | **154,462** | **156,238** | **158,035** | **159,853** | **161,691** | **163,550** | **165,431** | **167,334** | **169,258** | **171,204** | **173,173** | **175,165** | **177,179** | **179,217** |
| **Meath** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ashbourne/Ratoath | 1.76% (2006 - 2016); 1.15% (2017 - 2022); 1.15% (post 2022) | **Population** | 20,398 | 20,757 | 21,122 | 21,494 | 21,872 | 22,257 | 22,513 | 22,772 | 23,034 | 23,299 | 23,567 | 23,838 | 24,112 | 24,389 | 24,670 | 24,954 | 25,240 | 25,531 | 25,824 | 26,121 | 26,422 | 26,726 | 27,033 | 27,344 | 27,658 | 27,976 | 28,298 | 28,623 | 28,953 | 29,286 | 29,622 | 29,963 | 30,308 | 30,656 | 31,009 | 31,365 | 31,726 | 32,091 | 32,460 | 32,833 |
| | 16% of Res. Pop. | **Commercial** | 3,264 | 3,321 | 3,380 | 3,439 | 3,500 | 3,561 | 3,602 | 3,644 | 3,685 | 3,728 | 3,771 | 3,814 | 3,858 | 3,902 | 3,947 | 3,993 | 4,038 | 4,085 | 4,132 | 4,179 | 4,227 | 4,276 | 4,325 | 4,375 | 4,425 | 4,476 | 4,528 | 4,580 | 4,632 | 4,686 | 4,740 | 4,794 | 4,849 | 4,905 | 4,961 | 5,018 | 5,076 | 5,135 | 5,194 | 5,253 |
| Dunboyne/Clonee | 3.47% (2006 - 2016); 2.66% (2017 - 2022); 1.15% (post 2022) | **Population** | 7,590 | 7,853 | 8,126 | 8,408 | 8,700 | 9,001 | 9,241 | 9,487 | 9,739 | 9,998 | 10,264 | 10,537 | 10,658 | 10,781 | 10,905 | 11,030 | 11,157 | 11,285 | 11,415 | 11,546 | 11,679 | 11,814 | 11,949 | 12,087 | 12,226 | 12,366 | 12,509 | 12,652 | 12,798 | 12,945 | 13,094 | 13,245 | 13,397 | 13,551 | 13,707 | 13,864 | 14,024 | 14,185 | 14,348 | 14,513 |
| | 16% of Res. Pop. | **Commercial** | 1,214 | 1,257 | 1,300 | 1,345 | 1,392 | 1,440 | 1,479 | 1,518 | 1,558 | 1,600 | 1,642 | 1,686 | 1,705 | 1,725 | 1,745 | 1,765 | 1,785 | 1,806 | 1,826 | 1,847 | 1,869 | 1,890 | 1,912 | 1,934 | 1,956 | 1,979 | 2,001 | 2,024 | 2,048 | 2,071 | 2,095 | 2,119 | 2,144 | 2,168 | 2,193 | 2,218 | 2,244 | 2,270 | 2,296 | 2,322 |
| | Maintain at same % of total load to 2050 | **Industrial** | 1,000 | 1,026 | 1,049 | 1,073 | 1,097 | 1,121 | 1,139 | 1,157 | 1,176 | 1,195 | 1,214 | 1,233 | 1,247 | 1,262 | 1,276 | 1,291 | 1,306 | 1,321 | 1,336 | 1,351 | 1,367 | 1,383 | 1,399 | 1,415 | 1,431 | 1,447 | 1,464 | 1,481 | 1,498 | 1,515 | 1,533 | 1,550 | 1,568 | 1,586 | 1,604 | 1,623 | 1,641 | 1,660 | 1,679 | 1,699 |
| | | **Sub - Total** | **33,466** | **34,214** | **34,977** | **35,759** | **36,560** | **37,382** | **37,974** | **38,578** | **39,193** | **39,819** | **40,458** | **41,108** | **41,581** | **42,059** | **42,543** | **43,032** | **43,527** | **44,028** | **44,534** | **45,046** | **45,564** | **46,088** | **46,618** | **47,154** | **47,696** | **48,245** | **48,800** | **49,361** | **49,929** | **50,503** | **51,084** | **51,671** | **52,265** | **52,866** | **53,474** | **54,089** | **54,711** | **55,340** | **55,977** | **56,621** |
| | **Total Route 9C** | | **143,854** | **146,579** | **149,353** | **152,182** | **155,067** | **158,010** | **160,134** | **162,289** | **164,475** | **166,693** | **168,943** | **171,225** | **173,194** | **175,186** | **177,201** | **179,238** | **181,300** | **183,385** | **185,494** | **187,627** | **189,784** | **191,967** | **194,175** | **196,408** | **198,666** | **200,951** | **203,262** | **205,599** | **207,964** | **210,355** | **212,774** | **215,221** | **217,696** | **220,200** | **222,732** | **225,294** | **227,884** | **230,505** | **233,156** | **235,837** |

| Route 9C Sewer | Growth Rate (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blanchardstown (upstream of M50)** | 1.79% (2006 - 2016); 1.00% (post 2016) | **Population** | 89,602 | 91,206 | 92,838 | 94,500 | 96,192 | 97,914 | 98,893 | 99,882 | 100,881 | 101,889 | 102,908 | 103,937 | 104,977 | 106,026 | 107,087 | 108,158 | 109,239 | 110,332 | 111,435 | 112,549 | 113,675 | 114,811 | 115,960 | 117,119 | 118,290 | 119,473 | 120,668 | 121,875 | 123,093 | 124,324 | 125,568 | 126,823 | 128,092 | 129,372 | 130,666 | 131,973 | 133,293 | 134,625 | 135,972 | 137,331 |
| | 16% of Res. Pop. | **Commercial** | 14,336 | 14,593 | 14,854 | 15,120 | 15,391 | 15,666 | 15,823 | 15,981 | 16,141 | 16,302 | 16,465 | 16,630 | 16,796 | 16,964 | 17,134 | 17,305 | 17,478 | 17,653 | 17,830 | 18,008 | 18,188 | 18,370 | 18,554 | 18,739 | 18,926 | 19,116 | 19,307 | 19,500 | 19,695 | 19,892 | 20,091 | 20,292 | 20,495 | 20,700 | 20,907 | 21,116 | 21,327 | 21,540 | 21,755 | 21,973 |
| | Increase at 0.70% pa to 2050 | **Industrial** | 6,450 | 6,495 | 6,541 | 6,586 | 6,633 | 6,679 | 6,726 | 6,773 | 6,820 | 6,868 | 6,916 | 6,964 | 7,013 | 7,062 | 7,112 | 7,161 | 7,212 | 7,262 | 7,313 | 7,364 | 7,416 | 7,468 | 7,520 | 7,572 | 7,625 | 7,679 | 7,733 | 7,787 | 7,841 | 7,896 | 7,951 | 8,007 | 8,063 | 8,120 | 8,176 | 8,234 | 8,291 | 8,349 | 8,408 | 8,467 |
| | | **Sub - Total** | **110,388** | **112,294** | **114,233** | **116,207** | **118,215** | **120,259** | **121,441** | **122,636** | **123,842** | **125,060** | **126,290** | **127,532** | **128,786** | **130,053** | **131,332** | **132,624** | **133,929** | **135,247** | **136,577** | **137,921** | **139,278** | **140,649** | **142,033** | **143,431** | **144,842** | **146,268** | **147,707** | **149,161** | **150,630** | **152,112** | **153,610** | **155,122** | **156,649** | **158,192** | **159,749** | **161,322** | **162,911** | **164,515** | **166,135** | **167,771** |
| **Meath** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ashbourne/Ratoath | 1.76% (2006 - 2016); 1.00% (post 2016) | **Population** | 20,398 | 20,757 | 21,122 | 21,494 | 21,872 | 22,257 | 22,480 | 22,705 | 22,932 | 23,161 | 23,393 | 23,627 | 23,863 | 24,101 | 24,343 | 24,586 | 24,832 | 25,080 | 25,331 | 25,584 | 25,840 | 26,098 | 26,359 | 26,623 | 26,889 | 27,158 | 27,430 | 27,704 | 27,981 | 28,261 | 28,544 | 28,829 | 29,117 | 29,408 | 29,702 | 30,000 | 30,300 | 30,603 | 30,909 | 31,218 |
| | 16% of Res. Pop. | **Commercial** | 3,264 | 3,321 | 3,380 | 3,439 | 3,500 | 3,561 | 3,597 | 3,633 | 3,669 | 3,706 | 3,743 | 3,780 | 3,818 | 3,856 | 3,895 | 3,934 | 3,973 | 4,013 | 4,053 | 4,093 | 4,134 | 4,176 | 4,218 | 4,260 | 4,302 | 4,345 | 4,389 | 4,433 | 4,477 | 4,522 | 4,567 | 4,613 | 4,659 | 4,705 | 4,752 | 4,800 | 4,848 | 4,896 | 4,945 | 4,995 |
| Dunboyne/Clonee | 3.47% (2006 - 2016); 1.00% (post 2016) | **Population** | 7,590 | 7,853 | 8,126 | 8,408 | 8,700 | 9,001 | 9,091 | 9,182 | 9,274 | 9,367 | 9,461 | 9,555 | 9,651 | 9,747 | 9,845 | 9,943 | 10,043 | 10,143 | 10,245 | 10,347 | 10,450 | 10,555 | 10,660 | 10,767 | 10,875 | 10,984 | 11,093 | 11,204 | 11,316 | 11,429 | 11,544 | 11,659 | 11,776 | 11,894 | 12,013 | 12,133 | 12,254 | 12,377 | 12,500 | 12,625 |
| | 16% of Res. Pop. | **Commercial** | 1,214 | 1,257 | 1,300 | 1,345 | 1,392 | 1,440 | 1,455 | 1,469 | 1,484 | 1,499 | 1,514 | 1,529 | 1,544 | 1,560 | 1,575 | 1,591 | 1,607 | 1,623 | 1,639 | 1,656 | 1,672 | 1,689 | 1,706 | 1,723 | 1,740 | 1,757 | 1,775 | 1,793 | 1,811 | 1,829 | 1,847 | 1,865 | 1,884 | 1,903 | 1,922 | 1,941 | 1,961 | 1,980 | 2,000 | 2,020 |
| | Increase at 0.70% pa to 2050 | **Industrial** | 1,000 | 1,007 | 1,014 | 1,021 | 1,028 | 1,035 | 1,043 | 1,050 | 1,057 | 1,065 | 1,072 | 1,080 | 1,087 | 1,095 | 1,103 | 1,110 | 1,118 | 1,126 | 1,134 | 1,142 | 1,150 | 1,158 | 1,166 | 1,174 | 1,182 | 1,191 | 1,199 | 1,207 | 1,216 | 1,224 | 1,233 | 1,241 | 1,250 | 1,259 | 1,268 | 1,277 | 1,285 | 1,294 | 1,304 | 1,313 |
| | | **Sub - Total** | **33,466** | **34,195** | **34,942** | **35,707** | **36,492** | **37,296** | **37,666** | **38,039** | **38,416** | **38,797** | **39,182** | **39,571** | **39,963** | **40,360** | **40,760** | **41,164** | **41,572** | **41,985** | **42,401** | **42,822** | **43,247** | **43,676** | **44,109** | **44,547** | **44,989** | **45,435** | **45,886** | **46,341** | **46,801** | **47,265** | **47,734** | **48,208** | **48,686** | **49,169** | **49,657** | **50,150** | **50,648** | **51,150** | **51,658** | **52,170** |
| | **Total Route 9C** | | **143,854** | **146,489** | **149,175** | **151,914** | **154,707** | **157,554** | **159,107** | **160,675** | **162,258** | **163,857** | **165,472** | **167,102** | **168,749** | **170,412** | **172,092** | **173,788** | **175,501** | **177,232** | **178,979** | **180,743** | **182,525** | **184,325** | **186,142** | **187,977** | **189,831** | **191,703** | **193,593** | **195,502** | **197,430** | **199,377** | **201,344** | **203,330** | **205,335** | **207,361** | **209,406** | **211,472** | **213,558** | **215,665** | **217,793** | **219,941** |

Note: Flow & Load Survey undertaken in November/December 2011 suggests an average daily load equivalent to 9,674kgs of BOD in this catchment over the survey period
This equates to a Population Equivalent of 161,233PE. It includes catchment downstream of M50

**North Fringe Sewer**

| North Fringe Sewer | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fingal** | 1.79% (2006 - 2050) | **Population** | 30,486 | 31,032 | 31,587 | 32,153 | 32,728 | 33,314 | 33,910 | 34,517 | 35,135 | 35,764 | 36,404 | 37,056 | 37,719 | 38,394 | 39,082 | 39,781 | 40,493 | 41,218 | 41,956 | 42,707 | 43,471 | 44,249 | 45,042 | 45,848 | 46,668 | 47,504 | 48,354 | 49,220 | 50,101 | 50,997 | 51,910 | 52,840 | 53,785 | 54,748 | 55,728 | 56,726 | 57,741 | 58,775 | 59,827 | 60,898 |
| | 16% of Res. Pop. | **Commercial** | 4,878 | 4,965 | 5,054 | 5,144 | 5,236 | 5,330 | 5,426 | 5,523 | 5,622 | 5,722 | 5,825 | 5,929 | 6,035 | 6,143 | 6,253 | 6,365 | 6,479 | 6,595 | 6,713 | 6,833 | 6,955 | 7,080 | 7,207 | 7,336 | 7,467 | 7,601 | 7,737 | 7,875 | 8,016 | 8,160 | 8,306 | 8,454 | 8,606 | 8,760 | 8,916 | 9,076 | 9,239 | 9,404 | 9,572 | 9,744 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 3,090 | 3,224 | 3,364 | 3,509 | 3,661 | 3,820 | 3,986 | 4,158 | 4,338 | 4,526 | 4,723 | 4,927 | 5,141 | 5,363 | 5,596 | 5,680 | 5,765 | 5,851 | 5,939 | 6,028 | 6,119 | 6,210 | 6,304 | 6,398 | 6,494 | 6,592 | 6,690 | 6,791 | 6,893 | 6,996 | 7,095 | 7,195 | 7,296 | 7,399 | 7,503 | 7,609 | 7,716 | 7,825 | 7,936 | 8,047 |
| | | **Sub - Total** | **38,454** | **39,221** | **40,005** | **40,806** | **41,626** | **42,464** | **43,321** | **44,198** | **45,095** | **46,013** | **46,951** | **47,912** | **48,895** | **49,901** | **50,930** | **51,826** | **52,737** | **53,664** | **54,608** | **55,568** | **56,545** | **57,540** | **58,552** | **59,582** | **60,630** | **61,696** | **62,781** | **63,886** | **65,009** | **66,153** | **67,311** | **68,489** | **69,687** | **70,907** | **72,148** | **73,411** | **74,696** | **76,004** | **77,335** | **78,689** |
| **Dublin City** | 1.08% (2006 - 2016); 1.22% (post 2016) | **Population** | 64,543 | 65,240 | 65,945 | 66,657 | 67,377 | 68,104 | 68,935 | 69,776 | 70,628 | 71,489 | 72,361 | 73,244 | 74,138 | 75,042 | 75,958 | 76,884 | 77,822 | 78,772 | 79,733 | 80,706 | 81,690 | 82,687 | 83,696 | 84,717 | 85,750 | 86,796 | 87,855 | 88,927 | 90,012 | 91,110 | 92,222 | 93,347 | 94,486 | 95,638 | 96,805 | 97,986 | 99,182 | 100,392 | 101,617 | 102,856 |
| | 16% of Res. Pop. | **Commercial** | 10,327 | 10,438 | 10,551 | 10,665 | 10,780 | 10,897 | 11,030 | 11,164 | 11,300 | 11,438 | 11,578 | 11,719 | 11,862 | 12,007 | 12,153 | 12,302 | 12,452 | 12,604 | 12,757 | 12,913 | 13,070 | 13,230 | 13,391 | 13,555 | 13,720 | 13,887 | 14,057 | 14,228 | 14,402 | 14,578 | 14,755 | 14,936 | 15,118 | 15,302 | 15,489 | 15,678 | 15,869 | 16,063 | 16,259 | 16,457 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 4,560 | 4,758 | 4,964 | 5,179 | 5,403 | 5,637 | 5,882 | 6,136 | 6,402 | 6,680 | 6,969 | 7,271 | 7,586 | 7,915 | 8,258 | 8,382 | 8,507 | 8,635 | 8,765 | 8,896 | 9,030 | 9,165 | 9,302 | 9,442 | 9,584 | 9,727 | 9,873 | 10,021 | 10,172 | 10,324 | 10,470 | 10,617 | 10,767 | 10,919 | 11,073 | 11,229 | 11,387 | 11,548 | 11,711 | 11,876 |
| | | **Sub - Total** | **79,430** | **80,436** | **81,460** | **82,501** | **83,560** | **84,638** | **85,847** | **87,077** | **88,330** | **89,607** | **90,908** | **92,234** | **93,586** | **94,964** | **96,369** | **97,568** | **98,782** | **100,010** | **101,255** | **102,515** | **103,790** | **105,082** | **106,389** | **107,713** | **109,054** | **110,411** | **111,785** | **113,177** | **114,586** | **116,012** | **117,447** | **118,900** | **120,371** | **121,860** | **123,367** | **124,893** | **126,438** | **128,002** | **129,586** | **131,189** |
| | | **Total North Fringe Sewer** | **117,884** | **119,657** | **121,464** | **123,307** | **125,186** | **127,103** | **129,168** | **131,275** | **133,425** | **135,620** | **137,860** | **140,146** | **142,481** | **144,865** | **147,299** | **149,394** | **151,519** | **153,675** | **155,863** | **158,083** | **160,336** | **162,622** | **164,941** | **167,295** | **169,683** | **172,107** | **174,567** | **177,063** | **179,595** | **182,165** | **184,758** | **187,388** | **190,058** | **192,766** | **195,515** | **198,304** | **201,134** | **204,006** | **206,920** | **209,878** |

| North Fringe Sewer | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fingal** | 1.79% (2006 - 2016); 1.27% (2017 - 2022); 1.15% (post 2022) | **Population** | 30,486 | 31,032 | 31,587 | 32,153 | 32,728 | 33,314 | 33,737 | 34,165 | 34,599 | 35,039 | 35,484 | 35,934 | 36,348 | 36,766 | 37,188 | 37,616 | 38,049 | 38,486 | 38,929 | 39,377 | 39,829 | 40,287 | 40,751 | 41,219 | 41,693 | 42,173 | 42,658 | 43,148 | 43,645 | 44,147 | 44,654 | 45,168 | 45,687 | 46,213 | 46,744 | 47,282 | 47,825 | 48,375 | 48,932 | 49,494 |
| | 16% of Res Pop. | **Commercial** | 4,878 | 4,965 | 5,054 | 5,144 | 5,236 | 5,330 | 5,398 | 5,466 | 5,536 | 5,606 | 5,677 | 5,750 | 5,816 | 5,883 | 5,950 | 6,019 | 6,088 | 6,158 | 6,229 | 6,300 | 6,373 | 6,446 | 6,520 | 6,595 | 6,671 | 6,748 | 6,825 | 6,904 | 6,983 | 7,063 | 7,145 | 7,227 | 7,310 | 7,394 | 7,479 | 7,565 | 7,652 | 7,740 | 7,829 | 7,919 |
| | Maintain at same % of Total Load to 2050 | **Industrial** | 3,090 | 3,173 | 3,230 | 3,287 | 3,346 | 3,406 | 3,449 | 3,493 | 3,537 | 3,582 | 3,628 | 3,674 | 3,716 | 3,759 | 3,802 | 3,846 | 3,890 | 3,935 | 3,980 | 4,026 | 4,072 | 4,119 | 4,166 | 4,214 | 4,263 | 4,312 | 4,361 | 4,412 | 4,462 | 4,514 | 4,566 | 4,618 | 4,671 | 4,725 | 4,779 | 4,834 | 4,890 | 4,946 | 5,003 | 5,060 |
| | | **Sub - Total** | **38,454** | **39,170** | **39,871** | **40,584** | **41,311** | **42,050** | **42,584** | **43,125** | **43,673** | **44,227** | **44,789** | **45,358** | **45,880** | **46,407** | **46,941** | **47,481** | **48,027** | **48,579** | **49,138** | **49,703** | **50,274** | **50,852** | **51,437** | **52,029** | **52,627** | **53,232** | **53,845** | **54,464** | **55,090** | **55,724** | **56,364** | **57,013** | **57,668** | **58,331** | **59,002** | **59,681** | **60,367** | **61,061** | **61,764** | **62,474** |
| **Dublin City** | 1.08% (2006 - 2016); 1.22% (2017 - 2022); 1.15% (post 2022) | **Population** | 64,543 | 65,240 | 65,945 | 66,657 | 67,377 | 68,104 | 68,935 | 69,776 | 70,628 | 71,489 | 72,361 | 73,244 | 74,087 | 74,939 | 75,800 | 76,672 | 77,554 | 78,446 | 79,348 | 80,260 | 81,183 | 82,117 | 83,061 | 84,016 | 84,983 | 85,960 | 86,948 | 87,948 | 88,960 | 89,983 | 91,018 | 92,064 | 93,123 | 94,194 | 95,277 | 96,373 | 97,481 | 98,602 | 99,736 | 100,883 |
| | 16% of Res Pop. | **Commercial** | 10,327 | 10,438 | 10,551 | 10,665 | 10,780 | 10,897 | 11,030 | 11,164 | 11,300 | 11,438 | 11,578 | 11,719 | 11,854 | 11,990 | 12,128 | 12,268 | 12,409 | 12,551 | 12,696 | 12,842 | 12,989 | 13,139 | 13,290 | 13,443 | 13,597 | 13,754 | 13,912 | 14,072 | 14,234 | 14,397 | 14,563 | 14,730 | 14,900 | 15,071 | 15,244 | 15,420 | 15,597 | 15,776 | 15,958 | 16,141 |
| | Maintain at same % of Total Load to 2050 | **Industrial** | 4,560 | 4,617 | 4,667 | 4,717 | 4,768 | 4,820 | 4,878 | 4,938 | 4,998 | 5,059 | 5,121 | 5,183 | 5,243 | 5,303 | 5,364 | 5,426 | 5,488 | 5,552 | 5,615 | 5,680 | 5,745 | 5,811 | 5,878 | 5,946 | 6,014 | 6,083 | 6,153 | 6,224 | 6,296 | 6,368 | 6,441 | 6,515 | 6,590 | 6,666 | 6,743 | 6,820 | 6,899 | 6,978 | 7,058 | 7,139 |
| | | **Sub - Total** | **79,430** | **80,295** | **81,163** | **82,039** | **82,925** | **83,821** | **84,843** | **85,879** | **86,926** | **87,987** | **89,060** | **90,147** | **91,183** | **92,232** | **93,293** | **94,366** | **95,451** | **96,548** | **97,659** | **98,782** | **99,918** | **101,067** | **102,229** | **103,405** | **104,594** | **105,797** | **107,013** | **108,244** | **109,489** | **110,748** | **112,022** | **113,310** | **114,613** | **115,931** | **117,264** | **118,613** | **119,977** | **121,356** | **122,752** | **124,164** |
| | | **Total North Fringe Sewer** | **117,884** | **119,465** | **121,033** | **122,624** | **124,236** | **125,871** | **127,428** | **129,004** | **130,599** | **132,214** | **133,849** | **135,505** | **137,063** | **138,639** | **140,234** | **141,846** | **143,477** | **145,127** | **146,796** | **148,485** | **150,192** | **151,919** | **153,666** | **155,434** | **157,221** | **159,029** | **160,858** | **162,708** | **164,579** | **166,472** | **168,386** | **170,322** | **172,281** | **174,262** | **176,266** | **178,294** | **180,344** | **182,418** | **184,516** | **186,638** |

| North Fringe Sewer | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fingal** | 1.79% (2006 - 2016); 1.00% (post 2016) | **Population** | 30,486 | 31,032 | 31,587 | 32,153 | 32,728 | 33,314 | 33,647 | 33,984 | 34,323 | 34,667 | 35,013 | 35,363 | 35,717 | 36,074 | 36,435 | 36,799 | 37,167 | 37,539 | 37,914 | 38,294 | 38,676 | 39,063 | 39,454 | 39,848 | 40,247 | 40,649 | 41,056 | 41,466 | 41,881 | 42,300 | 42,723 | 43,150 | 43,582 | 44,017 | 44,458 | 44,902 | 45,351 | 45,805 | 46,263 | 46,725 |
| | 16% of Res. Pop. | **Commercial** | 4,878 | 4,965 | 5,054 | 5,144 | 5,236 | 5,330 | 5,384 | 5,437 | 5,492 | 5,547 | 5,602 | 5,658 | 5,715 | 5,772 | 5,830 | 5,888 | 5,947 | 6,006 | 6,066 | 6,127 | 6,188 | 6,250 | 6,313 | 6,376 | 6,439 | 6,504 | 6,569 | 6,635 | 6,701 | 6,768 | 6,836 | 6,904 | 6,973 | 7,043 | 7,113 | 7,184 | 7,256 | 7,329 | 7,402 | 7,476 |
| | Increase at 0.70% pa to 2050 | **Industrial** | 3,090 | 3,112 | 3,133 | 3,155 | 3,177 | 3,200 | 3,222 | 3,245 | 3,267 | 3,290 | 3,313 | 3,336 | 3,360 | 3,383 | 3,407 | 3,431 | 3,455 | 3,479 | 3,503 | 3,528 | 3,553 | 3,577 | 3,603 | 3,628 | 3,653 | 3,679 | 3,704 | 3,730 | 3,757 | 3,783 | 3,809 | 3,836 | 3,863 | 3,890 | 3,917 | 3,944 | 3,972 | 4,000 | 4,028 | 4,056 |
| | | **Sub - Total** | **38,454** | **39,108** | **39,775** | **40,452** | **41,142** | **41,844** | **42,253** | **42,666** | **43,082** | **43,503** | **43,929** | **44,358** | **44,792** | **45,229** | **45,672** | **46,118** | **46,569** | **47,024** | **47,484** | **47,948** | **48,417** | **48,891** | **49,369** | **49,852** | **50,340** | **50,832** | **51,329** | **51,831** | **52,339** | **52,851** | **53,368** | **53,890** | **54,417** | **54,950** | **55,488** | **56,031** | **56,579** | **57,133** | **57,693** | **58,258** |
| **Dublin City** | 1.08% (2006 - 2016); 1.00% (post 2016) | **Population** | 64,543 | 65,240 | 65,945 | 66,657 | 67,377 | 68,104 | 68,785 | 69,473 | 70,168 | 70,870 | 71,578 | 72,294 | 73,017 | 73,747 | 74,485 | 75,230 | 75,982 | 76,742 | 77,509 | 78,284 | 79,067 | 79,858 | 80,656 | 81,463 | 82,278 | 83,100 | 83,931 | 84,771 | 85,618 | 86,475 | 87,339 | 88,213 | 89,095 | 89,986 | 90,886 | 91,794 | 92,712 | 93,640 | 94,576 | 95,522 |
| | 16% of Res. Pop. | **Commercial** | 10,327 | 10,438 | 10,551 | 10,665 | 10,780 | 10,897 | 11,006 | 11,116 | 11,227 | 11,339 | 11,453 | 11,567 | 11,683 | 11,800 | 11,918 | 12,037 | 12,157 | 12,279 | 12,401 | 12,525 | 12,651 | 12,777 | 12,905 | 13,034 | 13,164 | 13,296 | 13,429 | 13,563 | 13,699 | 13,836 | 13,974 | 14,114 | 14,255 | 14,398 | 14,542 | 14,687 | 14,834 | 14,982 | 15,132 | 15,283 |
| | Increase at 0.70% to 2050 | **Industrial** | 4,560 | 4,592 | 4,624 | 4,656 | 4,689 | 4,722 | 4,755 | 4,788 | 4,822 | 4,855 | 4,889 | 4,924 | 4,958 | 4,993 | 5,028 | 5,063 | 5,098 | 5,134 | 5,170 | 5,206 | 5,243 | 5,279 | 5,316 | 5,354 | 5,391 | 5,429 | 5,467 | 5,505 | 5,544 | 5,582 | 5,621 | 5,661 | 5,700 | 5,740 | 5,781 | 5,821 | 5,862 | 5,903 | 5,944 | 5,986 |
| | | **Sub - Total** | **79,430** | **80,270** | **81,120** | **81,978** | **82,846** | **83,723** | **84,546** | **85,377** | **86,217** | **87,064** | **87,920** | **88,785** | **89,658** | **90,540** | **91,430** | **92,329** | **93,237** | **94,155** | **95,081** | **96,016** | **96,961** | **97,914** | **98,878** | **99,851** | **100,833** | **101,825** | **102,827** | **103,839** | **104,861** | **105,893** | **106,935** | **107,988** | **109,050** | **110,124** | **111,208** | **112,303** | **113,408** | **114,525** | **115,652** | **116,791** |
| | | **Total North Fringe Sewer** | **117,884** | **119,379** | **120,894** | **122,431** | **123,988** | **125,567** | **126,799** | **128,043** | **129,299** | **130,568** | **131,849** | **133,143** | **134,450** | **135,769** | **137,102** | **138,447** | **139,806** | **141,179** | **142,565** | **143,964** | **145,378** | **146,805** | **148,247** | **149,702** | **151,173** | **152,657** | **154,156** | **155,670** | **157,199** | **158,743** | **160,303** | **161,878** | **163,468** | **165,074** | **166,696** | **168,334** | **169,988** | **171,658** | **173,345** | **175,048** |

**NDDS Sewer**

| NDDS Sewer | Growth Rate (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dublin City** | 0.41% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 153,727 | 154,357 | 154,990 | 155,626 | 156,264 | 156,904 | 158,473 | 160,058 | 161,659 | 163,275 | 164,908 | 166,557 | 168,223 | 169,905 | 171,604 | 173,320 | 175,053 | 176,804 | 178,572 | 180,358 | 182,161 | 183,983 | 185,823 | 187,681 | 189,558 | 191,453 | 193,368 | 195,301 | 197,254 | 199,227 | 201,219 | 203,231 | 205,264 | 207,316 | 209,389 | 211,483 | 213,598 | 215,734 | 217,892 | 220,070 |
| | 16% of Res. Pop. | **Commercial** | 24,596 | 24,697 | 24,798 | 24,900 | 25,002 | 25,105 | 25,356 | 25,609 | 25,865 | 26,124 | 26,385 | 26,649 | 26,916 | 27,185 | 27,457 | 27,731 | 28,009 | 28,289 | 28,571 | 28,857 | 29,146 | 29,437 | 29,732 | 30,029 | 30,329 | 30,633 | 30,939 | 31,248 | 31,561 | 31,876 | 32,195 | 32,517 | 32,842 | 33,171 | 33,502 | 33,837 | 34,176 | 34,517 | 34,863 | 35,211 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 16,550 | 17,267 | 18,015 | 18,796 | 19,610 | 20,460 | 21,347 | 22,272 | 23,237 | 24,243 | 25,294 | 26,390 | 27,533 | 28,726 | 29,971 | 30,421 | 30,877 | 31,340 | 31,810 | 32,287 | 32,772 | 33,263 | 33,762 | 34,269 | 34,783 | 35,304 | 35,834 | 36,371 | 36,917 | 37,471 | 37,999 | 38,535 | 39,078 | 39,629 | 40,188 | 40,755 | 41,329 | 41,912 | 42,503 | 43,102 |
| | | **Sub - Total** | **194,873** | **196,322** | **197,804** | **199,322** | **200,876** | **202,469** | **205,176** | **207,939** | **210,761** | **213,643** | **216,587** | **219,596** | **222,672** | **225,816** | **229,032** | **231,472** | **233,939** | **236,432** | **238,953** | **241,502** | **244,078** | **246,683** | **249,316** | **251,978** | **254,669** | **257,390** | **260,140** | **262,921** | **265,732** | **268,574** | **271,413** | **274,283** | **277,184** | **280,116** | **283,080** | **286,075** | **289,103** | **292,164** | **295,257** | **298,384** |
| **Fingal** | 1.00% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 14,766 | 14,914 | 15,063 | 15,213 | 15,366 | 15,519 | 15,674 | 15,831 | 15,989 | 16,149 | 16,311 | 16,474 | 16,639 | 16,805 | 16,973 | 17,143 | 17,314 | 17,487 | 17,662 | 17,839 | 18,017 | 18,197 | 18,379 | 18,563 | 18,749 | 18,936 | 19,126 | 19,317 | 19,510 | 19,705 | 19,902 | 20,101 | 20,302 | 20,505 | 20,710 | 20,918 | 21,127 | 21,338 | 21,551 | 21,767 |
| | 16% of Res. Pop. | **Commercial** | 2,363 | 2,386 | 2,410 | 2,434 | 2,458 | 2,483 | 2,508 | 2,533 | 2,558 | 2,584 | 2,610 | 2,636 | 2,662 | 2,689 | 2,716 | 2,743 | 2,770 | 2,798 | 2,826 | 2,854 | 2,883 | 2,912 | 2,941 | 2,970 | 3,000 | 3,030 | 3,060 | 3,091 | 3,122 | 3,153 | 3,184 | 3,216 | 3,248 | 3,281 | 3,314 | 3,347 | 3,380 | 3,414 | 3,448 | 3,483 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Sub - Total** | **17,129** | **17,300** | **17,473** | **17,648** | **17,824** | **18,002** | **18,182** | **18,364** | **18,548** | **18,733** | **18,921** | **19,110** | **19,301** | **19,494** | **19,689** | **19,886** | **20,085** | **20,285** | **20,488** | **20,693** | **20,900** | **21,109** | **21,320** | **21,533** | **21,749** | **21,966** | **22,186** | **22,408** | **22,632** | **22,858** | **23,087** | **23,318** | **23,551** | **23,786** | **24,024** | **24,264** | **24,507** | **24,752** | **25,000** | **25,250** |
| | **Total NDDS Sewer** | | **212,002** | **213,621** | **215,277** | **216,969** | **218,700** | **220,471** | **223,358** | **226,303** | **229,308** | **232,376** | **235,508** | **238,706** | **241,973** | **245,310** | **248,720** | **251,358** | **254,023** | **256,718** | **259,442** | **262,195** | **264,979** | **267,792** | **270,636** | **273,512** | **276,418** | **279,356** | **282,326** | **285,329** | **288,364** | **291,432** | **294,500** | **297,601** | **300,735** | **303,902** | **307,104** | **310,340** | **313,610** | **316,916** | **320,257** | **323,634** |

| NDDS Sewer | Growth Rate (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dublin City** | 0.41% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 153,727 | 154,357 | 154,990 | 155,626 | 156,264 | 156,904 | 158,473 | 160,058 | 161,659 | 163,275 | 164,908 | 166,557 | 168,223 | 169,905 | 171,604 | 173,320 | 175,053 | 176,804 | 178,572 | 180,358 | 182,161 | 183,983 | 185,823 | 187,681 | 189,558 | 191,453 | 193,368 | 195,301 | 197,254 | 199,227 | 201,219 | 203,231 | 205,264 | 207,316 | 209,389 | 211,483 | 213,598 | 215,734 | 217,892 | 220,070 |
| | 16% of Res Pop | **Commercial** | 24,596 | 24,697 | 24,798 | 24,900 | 25,002 | 25,105 | 25,356 | 25,609 | 25,865 | 26,124 | 26,385 | 26,649 | 26,916 | 27,185 | 27,457 | 27,731 | 28,009 | 28,289 | 28,571 | 28,857 | 29,146 | 29,437 | 29,732 | 30,029 | 30,329 | 30,633 | 30,939 | 31,248 | 31,561 | 31,876 | 32,195 | 32,517 | 32,842 | 33,171 | 33,502 | 33,837 | 34,176 | 34,517 | 34,863 | 35,211 |
| | Maintain at same % of total load to 2050 | **Industrial** | 16,550 | 16,633 | 16,702 | 16,770 | 16,839 | 16,908 | 17,077 | 17,248 | 17,420 | 17,594 | 17,770 | 17,948 | 18,128 | 18,309 | 18,492 | 18,677 | 18,864 | 19,052 | 19,243 | 19,435 | 19,630 | 19,826 | 20,024 | 20,224 | 20,427 | 20,631 | 20,837 | 21,046 | 21,256 | 21,469 | 21,683 | 21,900 | 22,119 | 22,340 | 22,564 | 22,789 | 23,017 | 23,247 | 23,480 | 23,715 |
| | | **Sub - Total** | **194,873** | **195,688** | **196,490** | **197,296** | **198,105** | **198,917** | **200,906** | **202,915** | **204,944** | **206,994** | **209,064** | **211,154** | **213,266** | **215,399** | **217,553** | **219,728** | **221,925** | **224,145** | **226,386** | **228,650** | **230,936** | **233,246** | **235,578** | **237,934** | **240,313** | **242,717** | **245,144** | **247,595** | **250,071** | **252,572** | **255,098** | **257,648** | **260,225** | **262,827** | **265,455** | **268,110** | **270,791** | **273,499** | **276,234** | **278,996** |
| **Fingal** | 1.00% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 14,766 | 14,914 | 15,063 | 15,213 | 15,366 | 15,519 | 15,674 | 15,831 | 15,989 | 16,149 | 16,311 | 16,474 | 16,639 | 16,805 | 16,973 | 17,143 | 17,314 | 17,487 | 17,662 | 17,839 | 18,017 | 18,197 | 18,379 | 18,563 | 18,749 | 18,936 | 19,126 | 19,317 | 19,510 | 19,705 | 19,902 | 20,101 | 20,302 | 20,505 | 20,710 | 20,918 | 21,127 | 21,338 | 21,551 | 21,767 |
| | 16% of Res Pop | **Commercial** | 2,363 | 2,386 | 2,410 | 2,434 | 2,458 | 2,483 | 2,508 | 2,533 | 2,558 | 2,584 | 2,610 | 2,636 | 2,662 | 2,689 | 2,716 | 2,743 | 2,770 | 2,798 | 2,826 | 2,854 | 2,883 | 2,912 | 2,941 | 2,970 | 3,000 | 3,030 | 3,060 | 3,091 | 3,122 | 3,153 | 3,184 | 3,216 | 3,248 | 3,281 | 3,314 | 3,347 | 3,380 | 3,414 | 3,448 | 3,483 |
| | Maintain at same % of total load to 2050 | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Sub - Total** | **17,129** | **17,300** | **17,473** | **17,648** | **17,825** | **18,003** | **18,183** | **18,365** | **18,548** | **18,734** | **18,921** | **19,110** | **19,301** | **19,494** | **19,689** | **19,886** | **20,085** | **20,286** | **20,489** | **20,694** | **20,901** | **21,110** | **21,321** | **21,534** | **21,749** | **21,967** | **22,186** | **22,408** | **22,632** | **22,859** | **23,087** | **23,318** | **23,551** | **23,787** | **24,025** | **24,265** | **24,508** | **24,753** | **25,000** | **25,250** |
| | **Total NDDS Sewer** | | **212,002** | **212,988** | **213,964** | **214,944** | **215,929** | **216,920** | **219,089** | **221,280** | **223,493** | **225,728** | **227,985** | **230,265** | **232,567** | **234,893** | **237,242** | **239,614** | **242,011** | **244,431** | **246,875** | **249,344** | **251,837** | **254,356** | **256,899** | **259,468** | **262,063** | **264,683** | **267,330** | **270,003** | **272,704** | **275,431** | **278,185** | **280,967** | **283,776** | **286,614** | **289,480** | **292,375** | **295,299** | **298,252** | **301,234** | **304,247** |

| NDDS Sewer | Growth Rate (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dublin City** | 0.41% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 153,727 | 154,357 | 154,990 | 155,626 | 156,264 | 156,904 | 158,473 | 160,058 | 161,659 | 163,275 | 164,908 | 166,557 | 168,223 | 169,905 | 171,604 | 173,320 | 175,053 | 176,804 | 178,572 | 180,358 | 182,161 | 183,983 | 185,823 | 187,681 | 189,558 | 191,453 | 193,368 | 195,301 | 197,254 | 199,227 | 201,219 | 203,231 | 205,264 | 207,316 | 209,389 | 211,483 | 213,598 | 215,734 | 217,892 | 220,070 |
| | 16% of Res Pop | **Commercial** | 24,596 | 24,697 | 24,798 | 24,900 | 25,002 | 25,105 | 25,356 | 25,609 | 25,865 | 26,124 | 26,385 | 26,649 | 26,916 | 27,185 | 27,457 | 27,731 | 28,009 | 28,289 | 28,571 | 28,857 | 29,146 | 29,437 | 29,732 | 30,029 | 30,329 | 30,633 | 30,939 | 31,248 | 31,561 | 31,876 | 32,195 | 32,517 | 32,842 | 33,171 | 33,502 | 33,837 | 34,176 | 34,517 | 34,863 | 35,211 |
| | Increase at 0.70% pa to 2050 | **Industrial** | 16,550 | 16,666 | 16,783 | 16,900 | 17,018 | 17,137 | 17,257 | 17,378 | 17,500 | 17,622 | 17,746 | 17,870 | 17,995 | 18,121 | 18,248 | 18,376 | 18,504 | 18,634 | 18,764 | 18,895 | 19,028 | 19,161 | 19,295 | 19,430 | 19,566 | 19,703 | 19,841 | 19,980 | 20,120 | 20,261 | 20,402 | 20,545 | 20,689 | 20,834 | 20,980 | 21,127 | 21,274 | 21,423 | 21,573 | 21,724 |
| | | **Sub - Total** | **194,873** | **195,720** | **196,571** | **197,426** | **198,284** | **199,146** | **201,087** | **203,046** | **205,024** | **207,022** | **209,039** | **211,076** | **213,133** | **215,211** | **217,308** | **219,427** | **221,566** | **223,726** | **225,907** | **228,110** | **230,335** | **232,581** | **234,849** | **237,140** | **239,453** | **241,789** | **244,148** | **246,529** | **248,935** | **251,364** | **253,817** | **256,294** | **258,795** | **261,321** | **263,872** | **266,447** | **269,048** | **271,675** | **274,328** | **277,006** |
| **Fingal** | 1.00% (2006 - 2016); 1.00% (2017 - 2022); 1.00% (post 2022) | **Population** | 14,766 | 14,914 | 15,063 | 15,213 | 15,366 | 15,519 | 15,674 | 15,831 | 15,989 | 16,149 | 16,311 | 16,474 | 16,639 | 16,805 | 16,973 | 17,143 | 17,314 | 17,487 | 17,662 | 17,839 | 18,017 | 18,197 | 18,379 | 18,563 | 18,749 | 18,936 | 19,126 | 19,317 | 19,510 | 19,705 | 19,902 | 20,101 | 20,302 | 20,505 | 20,710 | 20,918 | 21,127 | 21,338 | 21,551 | 21,767 |
| | 16% of Res Pop | **Commercial** | 2,363 | 2,386 | 2,410 | 2,434 | 2,458 | 2,483 | 2,508 | 2,533 | 2,558 | 2,584 | 2,610 | 2,636 | 2,662 | 2,689 | 2,716 | 2,743 | 2,770 | 2,798 | 2,826 | 2,854 | 2,883 | 2,912 | 2,941 | 2,970 | 3,000 | 3,030 | 3,060 | 3,091 | 3,122 | 3,153 | 3,184 | 3,216 | 3,248 | 3,281 | 3,314 | 3,347 | 3,380 | 3,414 | 3,448 | 3,483 |
| | Increase at 0.70% pa to 2050 | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Sub - Total** | **17,129** | **17,300** | **17,473** | **17,648** | **17,824** | **18,002** | **18,182** | **18,364** | **18,548** | **18,733** | **18,921** | **19,110** | **19,301** | **19,494** | **19,689** | **19,886** | **20,085** | **20,285** | **20,488** | **20,693** | **20,900** | **21,109** | **21,320** | **21,533** | **21,749** | **21,966** | **22,186** | **22,408** | **22,632** | **22,858** | **23,087** | **23,318** | **23,551** | **23,786** | **24,024** | **24,264** | **24,507** | **24,752** | **25,000** | **25,250** |
| | **Total NDDS Sewer** | | **212,002** | **213,020** | **214,044** | **215,073** | **216,108** | **217,149** | **219,269** | **221,410** | **223,572** | **225,755** | **227,960** | **230,186** | **232,434** | **234,705** | **236,997** | **239,312** | **241,650** | **244,011** | **246,396** | **248,803** | **251,235** | **253,690** | **256,169** | **258,673** | **261,202** | **263,755** | **266,333** | **268,937** | **271,567** | **274,222** | **276,903** | **279,611** | **282,346** | **285,107** | **287,896** | **290,712** | **293,555** | **296,427** | **299,327** | **302,256** |

**Route 9B (Lucan/Clondalkin)**

| Route 9B Sewer | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lucan/Clondalkin | 1.41% (2006 - 2050) | Population | 68,617 | 69,584 | 70,566 | 71,561 | 72,570 | 73,593 | 74,631 | 75,683 | 76,750 | 77,832 | 78,930 | 80,042 | 81,171 | 82,316 | 83,476 | 84,653 | 85,847 | 87,057 | 88,285 | 89,530 | 90,792 | 92,072 | 93,370 | 94,687 | 96,022 | 97,376 | 98,749 | 100,141 | 101,553 | 102,985 | 104,437 | 105,910 | 107,403 | 108,917 | 110,453 | 112,011 | 113,590 | 115,192 | 116,816 | 118,463 |
| | 16% of Res. Pop. Estimated at 2011. Maintain to 2050 | Commercial | 10,979 | 11,134 | 11,291 | 11,450 | 11,611 | 11,775 | 11,941 | 12,109 | 12,280 | 12,453 | 12,629 | 12,807 | 12,987 | 13,170 | 13,356 | 13,545 | 13,735 | 13,929 | 14,126 | 14,325 | 14,527 | 14,732 | 14,939 | 15,150 | 15,364 | 15,580 | 15,800 | 16,023 | 16,249 | 16,478 | 16,710 | 16,946 | 17,184 | 17,427 | 17,673 | 17,922 | 18,174 | 18,431 | 18,691 | 18,954 |
| | 4.33% (2011 - 2025); 1.50% (2026 - 2040); 1.41% (post 2040) | Industrial | 1,400 | 1,461 | 1,524 | 1,590 | 1,659 | 1,731 | 1,806 | 1,884 | 1,966 | 2,051 | 2,140 | 2,232 | 2,329 | 2,430 | 2,535 | 2,573 | 2,612 | 2,651 | 2,691 | 2,731 | 2,772 | 2,814 | 2,856 | 2,899 | 2,942 | 2,986 | 3,031 | 3,077 | 3,123 | 3,170 | 3,214 | 3,260 | 3,306 | 3,352 | 3,400 | 3,448 | 3,496 | 3,545 | 3,595 | 3,646 |
| | **Total Route 9B Lucan/Clondalkin** | | **80,996** | **82,179** | **83,380** | **84,600** | **85,840** | **87,098** | **88,377** | **89,676** | **90,996** | **92,336** | **93,698** | **95,082** | **96,488** | **97,916** | **99,368** | **100,771** | **102,194** | **103,638** | **105,101** | **106,586** | **108,091** | **109,617** | **111,166** | **112,736** | **114,328** | **115,942** | **117,580** | **119,241** | **120,925** | **122,632** | **124,362** | **126,115** | **127,893** | **129,697** | **131,525** | **133,380** | **135,260** | **137,168** | **139,102** | **141,063** |

| Route 9B Sewer | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lucan/Clondalkin | 1.41% (2006 - 2016); 1.16% (2017 - 2022); 1.15% (post 2022) | Population | 68,617 | 69,584 | 70,566 | 71,561 | 72,570 | 73,593 | 74,447 | 75,310 | 76,184 | 77,067 | 77,961 | 78,866 | 79,773 | 80,690 | 81,618 | 82,557 | 83,506 | 84,466 | 85,438 | 86,420 | 87,414 | 88,419 | 89,436 | 90,465 | 91,505 | 92,557 | 93,622 | 94,698 | 95,787 | 96,889 | 98,003 | 99,130 | 100,270 | 101,423 | 102,590 | 103,770 | 104,963 | 106,170 | 107,391 | 108,626 |
| | 16% of Res. Pop. Estimated at 2011. Maintain to 2050 | Commercial | 10,979 | 11,134 | 11,291 | 11,450 | 11,611 | 11,775 | 11,911 | 12,050 | 12,189 | 12,331 | 12,474 | 12,619 | 12,764 | 12,910 | 13,059 | 13,209 | 13,361 | 13,515 | 13,670 | 13,827 | 13,986 | 14,147 | 14,310 | 14,474 | 14,641 | 14,809 | 14,979 | 15,152 | 15,326 | 15,502 | 15,681 | 15,861 | 16,043 | 16,228 | 16,414 | 16,603 | 16,794 | 16,987 | 17,183 | 17,380 |
| | Maintain at same % of total load to 2050 | Industrial | 1,400 | 1,438 | 1,458 | 1,479 | 1,499 | 1,521 | 1,538 | 1,556 | 1,574 | 1,592 | 1,611 | 1,629 | 1,648 | 1,667 | 1,686 | 1,706 | 1,725 | 1,745 | 1,765 | 1,786 | 1,806 | 1,827 | 1,848 | 1,869 | 1,891 | 1,912 | 1,934 | 1,957 | 1,979 | 2,002 | 2,025 | 2,048 | 2,072 | 2,096 | 2,120 | 2,144 | 2,169 | 2,194 | 2,219 | 2,244 |
| | **Total Route 9B Lucan/Clondalkin** | | **80,996** | **82,156** | **83,314** | **84,489** | **85,680** | **86,888** | **87,896** | **88,916** | **89,947** | **90,991** | **92,046** | **93,114** | **94,185** | **95,268** | **96,363** | **97,471** | **98,592** | **99,726** | **100,873** | **102,033** | **103,206** | **104,393** | **105,594** | **106,808** | **108,037** | **109,279** | **110,536** | **111,807** | **113,093** | **114,393** | **115,709** | **117,039** | **118,385** | **119,747** | **121,124** | **122,517** | **123,926** | **125,351** | **126,792** | **128,250** |

| Route 9B Sewer | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lucan/Clondalkin | 1.41% (2006 - 2016); 1.00% (post 2016) | Population | 68,617 | 69,584 | 70,566 | 71,561 | 72,570 | 73,593 | 74,329 | 75,072 | 75,823 | 76,581 | 77,347 | 78,120 | 78,901 | 79,691 | 80,487 | 81,292 | 82,105 | 82,926 | 83,756 | 84,593 | 85,439 | 86,293 | 87,156 | 88,028 | 88,908 | 89,797 | 90,695 | 91,602 | 92,518 | 93,443 | 94,378 | 95,322 | 96,275 | 97,238 | 98,210 | 99,192 | 100,184 | 101,186 | 102,198 | 103,220 |
| | 16% of Res. Pop. Estimated at 2011. Maintain to 2050 | Commercial | 10,979 | 11,134 | 11,291 | 11,450 | 11,611 | 11,775 | 11,893 | 12,012 | 12,132 | 12,253 | 12,375 | 12,499 | 12,624 | 12,750 | 12,878 | 13,007 | 13,137 | 13,268 | 13,401 | 13,535 | 13,670 | 13,807 | 13,945 | 14,084 | 14,225 | 14,368 | 14,511 | 14,656 | 14,803 | 14,951 | 15,100 | 15,251 | 15,404 | 15,558 | 15,714 | 15,871 | 16,029 | 16,190 | 16,352 | 16,515 |
| | Increase at 0.70% to 2050 | Industrial | 1,400 | 1,410 | 1,420 | 1,430 | 1,440 | 1,450 | 1,460 | 1,470 | 1,480 | 1,491 | 1,501 | 1,512 | 1,522 | 1,533 | 1,544 | 1,554 | 1,565 | 1,576 | 1,587 | 1,598 | 1,610 | 1,621 | 1,632 | 1,644 | 1,655 | 1,667 | 1,678 | 1,690 | 1,702 | 1,714 | 1,726 | 1,738 | 1,750 | 1,762 | 1,775 | 1,787 | 1,800 | 1,812 | 1,825 | 1,838 |
| | **Total Route 9B Lucan/Clondalkin** | | **80,996** | **82,128** | **83,276** | **84,440** | **85,620** | **86,817** | **87,681** | **88,554** | **89,435** | **90,325** | **91,223** | **92,131** | **93,048** | **93,974** | **94,909** | **95,853** | **96,807** | **97,771** | **98,744** | **99,726** | **100,719** | **101,721** | **102,734** | **103,756** | **104,789** | **105,832** | **106,885** | **107,949** | **109,023** | **110,108** | **111,204** | **112,311** | **113,429** | **114,558** | **115,698** | **116,850** | **118,013** | **119,188** | **120,374** | **121,572** |

**Swords WwTP**

| Swords WwTP | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2050) | **Population** | 43,577 | 44,357 | 45,151 | 45,959 | 46,782 | 47,619 | 48,472 | 49,339 | 50,222 | 51,121 | 52,037 | 52,968 | 53,916 | 54,881 | 55,864 | 56,864 | 57,881 | 58,917 | 59,972 | 61,046 | 62,138 | 63,251 | 64,383 | 65,535 | 66,708 | 67,902 | 69,118 | 70,355 | 71,614 | 72,896 | 74,201 | 75,529 | 76,881 | 78,258 | 79,658 | 81,084 | 82,536 | 84,013 | 85,517 | 87,048 |
| | 16% of Residential Population | **Commercial** | 6,972 | 7,097 | 7,224 | 7,353 | 7,485 | 7,619 | 7,755 | 7,894 | 8,036 | 8,179 | 8,326 | 8,475 | 8,627 | 8,781 | 8,938 | 9,098 | 9,261 | 9,427 | 9,596 | 9,767 | 9,942 | 10,120 | 10,301 | 10,486 | 10,673 | 10,864 | 11,059 | 11,257 | 11,458 | 11,663 | 11,872 | 12,085 | 12,301 | 12,521 | 12,745 | 12,973 | 13,206 | 13,442 | 13,683 | 13,928 |
| | Grow to 25,000 by 2050 = 5.60% (2011 - 2050) | **Industrial** | 3,000 | 3,168 | 3,345 | 3,533 | 3,731 | 3,939 | 4,160 | 4,393 | 4,639 | 4,899 | 5,173 | 5,463 | 5,769 | 6,092 | 6,433 | 6,793 | 7,174 | 7,575 | 8,000 | 8,448 | 8,921 | 9,420 | 9,948 | 10,505 | 11,093 | 11,714 | 12,370 | 13,063 | 13,795 | 14,567 | 15,383 | 16,244 | 17,154 | 18,115 | 19,129 | 20,200 | 21,332 | 22,526 | 23,788 | 25,120 |
| | **Total Swords WwTP** | | **53,549** | **54,622** | **55,721** | **56,845** | **57,998** | **59,178** | **60,387** | **61,627** | **62,897** | **64,200** | **65,536** | **66,906** | **68,312** | **69,754** | **71,235** | **72,755** | **74,316** | **75,920** | **77,567** | **79,261** | **81,001** | **82,791** | **84,632** | **86,526** | **88,475** | **90,481** | **92,547** | **94,675** | **96,867** | **99,127** | **101,456** | **103,858** | **106,336** | **108,893** | **111,533** | **114,258** | **117,073** | **119,981** | **122,987** | **126,095** |

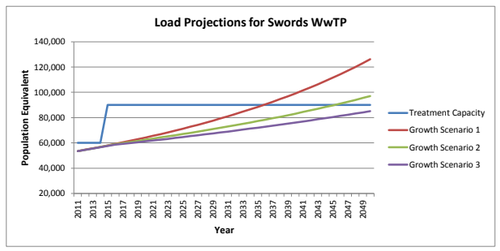
| Swords WwTP | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2016); 1.27% (2017 - 2022); 1.15% (post 2022) | **Population** | 43,577 | 44,357 | 45,151 | 45,959 | 46,782 | 47,619 | 48,224 | 48,836 | 49,457 | 50,085 | 50,721 | 51,365 | 51,956 | 52,553 | 53,158 | 53,769 | 54,387 | 55,013 | 55,645 | 56,285 | 56,933 | 57,587 | 58,250 | 58,919 | 59,597 | 60,282 | 60,976 | 61,677 | 62,386 | 63,104 | 63,829 | 64,563 | 65,306 | 66,057 | 66,816 | 67,585 | 68,362 | 69,148 | 69,943 | 70,748 |
| | 16% of Residential Population | **Commercial** | 6,972 | 7,097 | 7,224 | 7,353 | 7,485 | 7,619 | 7,716 | 7,814 | 7,913 | 8,014 | 8,115 | 8,218 | 8,313 | 8,409 | 8,505 | 8,603 | 8,702 | 8,802 | 8,903 | 9,006 | 9,109 | 9,214 | 9,320 | 9,427 | 9,536 | 9,645 | 9,756 | 9,868 | 9,982 | 10,097 | 10,213 | 10,330 | 10,449 | 10,569 | 10,691 | 10,814 | 10,938 | 11,064 | 11,191 | 11,320 |
| | Grow to 15,000 at 2050 = 4.20% (2011 - 2050) | **Industrial** | 3,000 | 3,126 | 3,258 | 3,395 | 3,538 | 3,687 | 3,842 | 4,004 | 4,173 | 4,348 | 4,531 | 4,722 | 4,921 | 5,128 | 5,344 | 5,569 | 5,803 | 6,048 | 6,302 | 6,567 | 6,844 | 7,132 | 7,432 | 7,745 | 8,071 | 8,411 | 8,765 | 9,134 | 9,519 | 9,920 | 10,337 | 10,772 | 11,226 | 11,699 | 12,191 | 12,704 | 13,239 | 13,796 | 14,377 | 14,983 |
| | **Total Swords WwTP** | | **53,549** | **54,580** | **55,633** | **56,708** | **57,805** | **58,925** | **59,782** | **60,654** | **61,542** | **62,447** | **63,367** | **64,305** | **65,189** | **66,090** | **67,007** | **67,941** | **68,892** | **69,862** | **70,851** | **71,858** | **72,886** | **73,933** | **75,002** | **76,092** | **77,204** | **78,339** | **79,497** | **80,679** | **81,887** | **83,120** | **84,379** | **85,666** | **86,981** | **88,324** | **89,698** | **91,103** | **92,539** | **94,008** | **95,512** | **97,050** |

| Swords WwTP | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2016); 1.00% (post 2016) | **Population** | 43,577 | 44,357 | 45,151 | 45,959 | 46,782 | 47,619 | 48,095 | 48,576 | 49,062 | 49,553 | 50,048 | 50,549 | 51,054 | 51,565 | 52,081 | 52,601 | 53,127 | 53,659 | 54,195 | 54,737 | 55,285 | 55,837 | 56,396 | 56,960 | 57,529 | 58,105 | 58,686 | 59,272 | 59,865 | 60,464 | 61,068 | 61,679 | 62,296 | 62,919 | 63,548 | 64,184 | 64,825 | 65,474 | 66,128 | 66,790 |
| | 16% of Residential Population | **Commercial** | 6,972 | 7,097 | 7,224 | 7,353 | 7,485 | 7,619 | 7,695 | 7,772 | 7,850 | 7,928 | 8,008 | 8,088 | 8,169 | 8,250 | 8,333 | 8,416 | 8,500 | 8,585 | 8,671 | 8,758 | 8,846 | 8,934 | 9,023 | 9,114 | 9,205 | 9,297 | 9,390 | 9,484 | 9,578 | 9,674 | 9,771 | 9,869 | 9,967 | 10,067 | 10,168 | 10,269 | 10,372 | 10,476 | 10,581 | 10,686 |
| | Grow to 7,500 at 2050 = 2.4% (2011 - 2050) | **Industrial** | 3,000 | 3,072 | 3,146 | 3,221 | 3,299 | 3,378 | 3,459 | 3,542 | 3,627 | 3,714 | 3,803 | 3,894 | 3,988 | 4,083 | 4,181 | 4,282 | 4,385 | 4,490 | 4,597 | 4,708 | 4,821 | 4,937 | 5,055 | 5,176 | 5,301 | 5,428 | 5,558 | 5,691 | 5,828 | 5,968 | 6,111 | 6,258 | 6,408 | 6,562 | 6,719 | 6,880 | 7,046 | 7,215 | 7,388 | 7,565 |
| | **Total Swords WwTP** | | **53,549** | **54,526** | **55,521** | **56,534** | **57,566** | **58,616** | **59,250** | **59,890** | **60,539** | **61,195** | **61,859** | **62,531** | **63,211** | **63,899** | **64,595** | **65,299** | **66,012** | **66,734** | **67,464** | **68,203** | **68,951** | **69,708** | **70,474** | **71,250** | **72,035** | **72,829** | **73,633** | **74,447** | **75,272** | **76,106** | **76,951** | **77,806** | **78,671** | **79,548** | **80,435** | **81,333** | **82,243** | **83,164** | **84,097** | **85,041** |

**Swords WwTP - Summary**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment Capacity | 60,000 | 60,000 | 60,000 | 60,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 |
| Growth Scenario 1 | 53,549 | 54,622 | 55,721 | 56,845 | 57,998 | 59,178 | 60,387 | 61,627 | 62,897 | 64,200 | 65,536 | 66,906 | 68,312 | 69,754 | 71,235 | 72,755 | 74,316 | 75,920 | 77,567 | 79,261 | 81,001 | 82,791 | 84,632 | 86,526 | 88,475 | 90,481 | 92,547 | 94,675 | 96,867 | 99,127 | 101,456 | 103,858 | 106,336 | 108,893 | 111,533 | 114,258 | 117,073 | 119,981 | 122,987 | 126,095 |
| Growth Scenario 2 | 53,549 | 54,580 | 55,633 | 56,708 | 57,805 | 58,925 | 59,782 | 60,654 | 61,542 | 62,447 | 63,367 | 64,305 | 65,189 | 66,090 | 67,007 | 67,941 | 68,892 | 69,862 | 70,851 | 71,858 | 72,886 | 73,933 | 75,002 | 76,092 | 77,204 | 78,339 | 79,497 | 80,679 | 81,887 | 83,120 | 84,379 | 85,666 | 86,981 | 88,324 | 89,698 | 91,103 | 92,539 | 94,008 | 95,512 | 97,050 |
| Growth Scenario 3 | 53,549 | 54,526 | 55,521 | 56,534 | 57,566 | 58,616 | 59,250 | 59,890 | 60,539 | 61,195 | 61,859 | 62,531 | 63,211 | 63,899 | 64,595 | 65,299 | 66,012 | 66,734 | 67,464 | 68,203 | 68,951 | 69,708 | 70,474 | 71,250 | 72,035 | 72,829 | 73,633 | 74,447 | 75,272 | 76,106 | 76,951 | 77,806 | 78,671 | 79,548 | 80,435 | 81,333 | 82,243 | 83,164 | 84,097 | 85,041 |

**Note:** Average Daily Loading to Swords WwTP for 2011 (Jan - Dec) is reported by FCC at 63,235 PE




**Swords WwTP - Load Transfer to Regional WwTP**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment Capacity Swords WwTP | 60,000 | 60,000 | 60,000 | 60,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 | 90,000 |
| Growth Scenario 1 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,547 | 4,675 | 6,867 | 9,127 | 11,456 | 13,858 | 16,336 | 18,893 | 21,533 | 24,258 | 27,073 | 29,981 | 32,987 | 36,095 |
| Growth Scenario 2 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,539 | 4,008 | 5,512 | 7,050 | | |
| Growth Scenario 3 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

**Malahide WwTP**

| Malahide WwTP | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2050) | **Population** | 16,480 | 16,775 | 17,075 | 17,381 | 17,692 | 18,009 | 18,331 | 18,659 | 18,993 | 19,333 | 19,679 | 20,031 | 20,390 | 20,755 | 21,127 | 21,505 | 21,890 | 22,281 | 22,680 | 23,086 | 23,500 | 23,920 | 24,348 | 24,784 | 25,228 | 25,679 | 26,139 | 26,607 | 27,083 | 27,568 | 28,061 | 28,564 | 29,075 | 29,596 | 30,125 | 30,665 | 31,213 | 31,772 | 32,341 | 32,920 |
| | 16% of Residential Population | **Commercial** | 2,637 | 2,684 | 2,732 | 2,781 | 2,831 | 2,881 | 2,933 | 2,985 | 3,039 | 3,093 | 3,149 | 3,205 | 3,262 | 3,321 | 3,380 | 3,441 | 3,502 | 3,565 | 3,629 | 3,694 | 3,760 | 3,827 | 3,896 | 3,965 | 4,036 | 4,109 | 4,182 | 4,257 | 4,333 | 4,411 | 4,490 | 4,570 | 4,652 | 4,735 | 4,820 | 4,906 | 4,994 | 5,084 | 5,175 | 5,267 |
| | No Industrial Load in Malahide | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Total Malahide WwTP** | **19,117** | **19,459** | **19,807** | **20,162** | **20,523** | **20,890** | **21,264** | **21,645** | **22,032** | **22,426** | **22,828** | **23,237** | **23,652** | **24,076** | **24,507** | **24,945** | **25,392** | **25,847** | **26,309** | **26,780** | **27,259** | **27,747** | **28,244** | **28,750** | **29,264** | **29,788** | **30,321** | **30,864** | **31,417** | **31,979** | **32,551** | **33,134** | **33,727** | **34,331** | **34,945** | **35,571** | **36,208** | **36,856** | **37,515** | **38,187** |

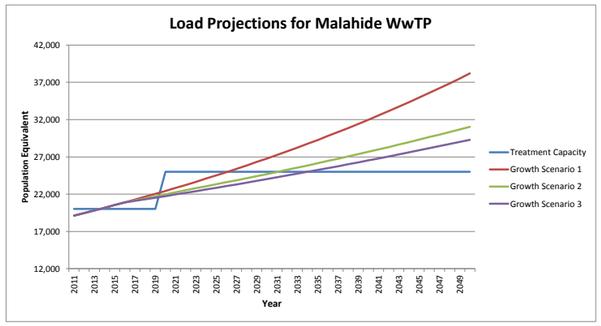
| Malahide WwTP | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2016); 1.27% (2017 - 2022); 1.15% (post 2022) | **Population** | 16,480 | 16,775 | 17,075 | 17,381 | 17,692 | 18,009 | 18,237 | 18,469 | 18,704 | 18,941 | 19,182 | 19,425 | 19,649 | 19,875 | 20,103 | 20,334 | 20,568 | 20,805 | 21,044 | 21,286 | 21,531 | 21,778 | 22,029 | 22,282 | 22,538 | 22,798 | 23,060 | 23,325 | 23,593 | 23,865 | 24,139 | 24,417 | 24,697 | 24,981 | 25,269 | 25,559 | 25,853 | 26,151 | 26,451 | 26,755 |
| | 16% of Residential Population | **Commercial** | 2,637 | 2,684 | 2,732 | 2,781 | 2,831 | 2,881 | 2,918 | 2,955 | 2,993 | 3,031 | 3,069 | 3,108 | 3,144 | 3,180 | 3,217 | 3,254 | 3,291 | 3,329 | 3,367 | 3,406 | 3,445 | 3,485 | 3,525 | 3,565 | 3,606 | 3,648 | 3,690 | 3,732 | 3,775 | 3,818 | 3,862 | 3,907 | 3,952 | 3,997 | 4,043 | 4,089 | 4,137 | 4,184 | 4,232 | 4,281 |
| | No Industrial Load in Malahide | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Total Malahide WwTP** | **19,117** | **19,459** | **19,807** | **20,162** | **20,523** | **20,890** | **21,155** | **21,424** | **21,696** | **21,972** | **22,251** | **22,533** | **22,792** | **23,055** | **23,320** | **23,588** | **23,859** | **24,134** | **24,411** | **24,692** | **24,976** | **25,263** | **25,553** | **25,847** | **26,145** | **26,445** | **26,749** | **27,057** | **27,368** | **27,683** | **28,001** | **28,323** | **28,649** | **28,978** | **29,312** | **29,649** | **29,990** | **30,335** | **30,683** | **31,036** |

| Malahide WwTP | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.79% (2006 - 2016); 1.00% (post 2022) | **Population** | 16,480 | 16,775 | 17,075 | 17,381 | 17,692 | 18,009 | 18,189 | 18,371 | 18,554 | 18,740 | 18,927 | 19,117 | 19,308 | 19,501 | 19,696 | 19,893 | 20,092 | 20,293 | 20,496 | 20,701 | 20,908 | 21,117 | 21,328 | 21,541 | 21,756 | 21,974 | 22,194 | 22,416 | 22,640 | 22,866 | 23,095 | 23,326 | 23,559 | 23,795 | 24,033 | 24,273 | 24,516 | 24,761 | 25,009 | 25,259 |
| | 16% of Residential Population | **Commercial** | 2,637 | 2,684 | 2,732 | 2,781 | 2,831 | 2,881 | 2,910 | 2,939 | 2,969 | 2,998 | 3,028 | 3,059 | 3,089 | 3,120 | 3,151 | 3,183 | 3,215 | 3,247 | 3,279 | 3,312 | 3,345 | 3,379 | 3,412 | 3,447 | 3,481 | 3,516 | 3,551 | 3,587 | 3,622 | 3,659 | 3,695 | 3,732 | 3,769 | 3,807 | 3,845 | 3,884 | 3,923 | 3,962 | 4,001 | 4,041 |
| | No Industrial Load in Malahide | **Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Total Malahide WwTP** | **19,117** | **19,459** | **19,807** | **20,162** | **20,523** | **20,890** | **21,099** | **21,310** | **21,523** | **21,738** | **21,956** | **22,175** | **22,397** | **22,621** | **22,847** | **23,076** | **23,306** | **23,540** | **23,775** | **24,013** | **24,253** | **24,495** | **24,740** | **24,988** | **25,238** | **25,490** | **25,745** | **26,002** | **26,262** | **26,525** | **26,790** | **27,058** | **27,329** | **27,602** | **27,878** | **28,157** | **28,438** | **28,723** | **29,010** | **29,300** |

**Malahide WwTP**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Treatment Capacity** | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| Growth Scenario 1 | 19,117 | 19,459 | 19,807 | 20,162 | 20,523 | 20,890 | 21,264 | 21,645 | 22,032 | 22,426 | 22,828 | 23,237 | 23,652 | 24,076 | 24,507 | 24,945 | 25,392 | 25,847 | 26,309 | 26,780 | 27,259 | 27,747 | 28,244 | 28,750 | 29,264 | 29,788 | 30,321 | 30,864 | 31,417 | 31,979 | 32,551 | 33,134 | 33,727 | 34,331 | 34,945 | 35,571 | 36,208 | 36,856 | 37,515 | 38,187 |
| Growth Scenario 2 | 19,117 | 19,459 | 19,807 | 20,162 | 20,523 | 20,890 | 21,155 | 21,424 | 21,696 | 21,972 | 22,251 | 22,533 | 22,792 | 23,055 | 23,320 | 23,588 | 23,859 | 24,134 | 24,411 | 24,692 | 24,976 | 25,263 | 25,553 | 25,847 | 26,145 | 26,445 | 26,749 | 27,057 | 27,368 | 27,683 | 28,001 | 28,323 | 28,649 | 28,978 | 29,312 | 29,649 | 29,990 | 30,335 | 30,683 | 31,036 |
| Growth Scenario 3 | 19,117 | 19,459 | 19,807 | 20,162 | 20,523 | 20,890 | 21,099 | 21,310 | 21,523 | 21,738 | 21,956 | 22,175 | 22,397 | 22,621 | 22,847 | 23,076 | 23,306 | 23,540 | 23,775 | 24,013 | 24,253 | 24,495 | 24,740 | 24,988 | 25,238 | 25,490 | 25,745 | 26,002 | 26,262 | 26,525 | 26,790 | 27,058 | 27,329 | 27,602 | 27,878 | 28,157 | 28,438 | 28,723 | 29,010 | 29,300 |

**Note:** Average Daily Loading to Malahide WwTP for 2011 (Jan - Nov) is reported by FCC at 14,000 PE




**Malahide WwTP - Load Transfers to Regional WwTP**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Treatment Capacity Malahide WwTP** | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| Growth Scenario 1 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,309 | 1,780 | 2,259 | 2,747 | 3,244 | 3,750 | 4,264 | 4,788 | 5,321 | 5,864 | 6,417 | 6,979 | 7,551 | 8,134 | 8,727 | 9,331 | 9,945 | 10,571 | 11,208 | 11,856 | 12,515 | 13,187 |
| Growth Scenario 2 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,145 | 1,445 | 1,749 | 2,057 | 2,368 | 2,683 | 3,001 | 3,323 | 3,649 | 3,978 | 4,312 | 4,649 | 4,990 | 5,335 | 5,683 | 6,036 |
| Growth Scenario 3 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,002 | 1,262 | 1,525 | 1,790 | 2,058 | 2,329 | 2,602 | 2,878 | 3,157 | 3,438 | 3,723 | 4,010 | 4,300 |

**Leixlip WwTP**

| Leixlip WwTP | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.64% (2006 - 2050) | **Population** | 54,147 | 55,576 | 57,044 | 58,550 | 60,095 | 61,682 | 63,310 | 64,982 | 66,697 | 68,458 | 70,265 | 72,120 | 74,024 | 75,979 | 77,984 | 80,043 | 82,156 | 84,325 | 86,551 | 88,836 | 91,182 | 93,589 | 96,060 | 98,596 | 101,198 | 103,870 | 106,612 | 109,427 | 112,316 | 115,281 | 118,324 | 121,448 | 124,654 | 127,945 | 131,323 | 134,790 | 138,348 | 142,001 | 145,749 | 149,597 |
| | 16% of Residential Population | **Commercial** | 8,664 | 8,892 | 9,127 | 9,368 | 9,615 | 9,869 | 10,130 | 10,397 | 10,672 | 10,953 | 11,242 | 11,539 | 11,844 | 12,157 | 12,477 | 12,807 | 13,145 | 13,492 | 13,848 | 14,214 | 14,589 | 14,974 | 15,370 | 15,775 | 16,192 | 16,619 | 17,058 | 17,508 | 17,971 | 18,445 | 18,932 | 19,432 | 19,945 | 20,471 | 21,012 | 21,566 | 22,136 | 22,720 | 23,320 | 23,936 |
| | Co Meath Reserve Capacity (8,000 PE) | **Meath Contrib.** | | | | | | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 |
| | Intel (reserve capacity) | **Industrial** | 22,500 | 22,500 | 63,333 | 63,333 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 |
| | Industrial Reserve Capacity (30,000 PE) | **Industrial** | | | | | | | | | | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| | | **Total Leixlip WwTP** | **85,311** | **86,969** | **129,504** | **131,251** | **154,411** | **164,251** | **166,140** | **168,079** | **170,069** | **202,111** | **204,208** | **206,360** | **208,568** | **210,835** | **213,162** | **215,550** | **218,001** | **220,517** | **223,100** | **225,750** | **228,471** | **231,263** | **234,129** | **237,071** | **240,090** | **243,189** | **246,370** | **249,635** | **252,986** | **256,426** | **259,956** | **263,580** | **267,299** | **271,116** | **275,034** | **279,056** | **283,184** | **287,421** | **291,769** | **296,233** |

| Leixlip WwTP | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.64% (2006 - 2016); 1.83% (2017 - 2022); 1.15% (post 2022) | **Population** | 54,147 | 55,576 | 57,044 | 58,550 | 60,095 | 61,682 | 62,811 | 63,960 | 65,131 | 66,322 | 67,536 | 68,772 | 69,563 | 70,363 | 71,172 | 71,991 | 72,818 | 73,656 | 74,503 | 75,360 | 76,226 | 77,103 | 77,990 | 78,887 | 79,794 | 80,711 | 81,640 | 82,578 | 83,528 | 84,489 | 85,460 | 86,443 | 87,437 | 88,443 | 89,460 | 90,488 | 91,529 | 92,582 | 93,646 | 94,723 |
| | 16% of Residential Population | **Commercial** | 8,664 | 8,892 | 9,127 | 9,368 | 9,615 | 9,869 | 10,050 | 10,234 | 10,421 | 10,612 | 10,806 | 11,004 | 11,130 | 11,258 | 11,388 | 11,518 | 11,651 | 11,785 | 11,920 | 12,058 | 12,196 | 12,336 | 12,478 | 12,622 | 12,767 | 12,914 | 13,062 | 13,213 | 13,364 | 13,518 | 13,674 | 13,831 | 13,990 | 14,151 | 14,314 | 14,478 | 14,645 | 14,813 | 14,983 | 15,156 |
| | Co Meath Reserve Capacity (8,000 PE) | **Meath Contrib** | | | | | | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 |
| | Intel (reserve capacity) | **Industrial** | 22,500 | 22,500 | 63,333 | 63,333 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 | 84,700 |
| | Industrial Reserve Capacity (15,000 PE) | **Industrial** | | | | | | | | | | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| | | **Total Leixlip WwTP** | **85,311** | **86,969** | **129,504** | **131,251** | **154,411** | **164,251** | **165,560** | **166,894** | **168,251** | **184,634** | **186,042** | **187,476** | **188,393** | **189,321** | **190,260** | **191,209** | **192,169** | **193,141** | **194,123** | **195,117** | **196,123** | **197,139** | **198,168** | **199,208** | **200,261** | **201,325** | **202,402** | **203,491** | **204,592** | **205,707** | **206,834** | **207,974** | **209,127** | **210,293** | **211,473** | **212,667** | **213,874** | **215,095** | **216,330** | **217,579** |

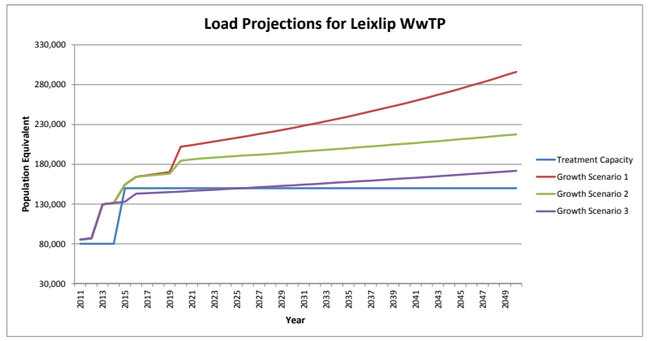
| Leixlips WwTP | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.64% (2006 - 2016); 1.00% (post 2016) | **Population** | 54,147 | 55,576 | 57,044 | 58,550 | 60,095 | 61,682 | 62,299 | 62,922 | 63,551 | 64,186 | 64,828 | 65,477 | 66,131 | 66,793 | 67,461 | 68,135 | 68,817 | 69,505 | 70,200 | 70,902 | 71,611 | 72,327 | 73,050 | 73,781 | 74,518 | 75,264 | 76,016 | 76,776 | 77,544 | 78,320 | 79,103 | 79,894 | 80,693 | 81,500 | 82,315 | 83,138 | 83,969 | 84,809 | 85,657 | 86,514 |
| | 16% of Residential Population | **Commercial** | 8,664 | 8,892 | 9,127 | 9,368 | 9,615 | 9,869 | 9,968 | 10,067 | 10,168 | 10,270 | 10,373 | 10,476 | 10,581 | 10,687 | 10,794 | 10,902 | 11,011 | 11,121 | 11,232 | 11,344 | 11,458 | 11,572 | 11,688 | 11,805 | 11,923 | 12,042 | 12,163 | 12,284 | 12,407 | 12,531 | 12,656 | 12,783 | 12,911 | 13,040 | 13,170 | 13,302 | 13,435 | 13,569 | 13,705 | 13,842 |
| | Co Meath Reserve Capacity (8,000 PE) | **Meath Contrib** | | | | | | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 |
| | Intel (reserve capacity) | **Industrial** | 22,500 | 22,500 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 | 63,333 |
| | Industrial Reserve Capacity | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Total Leixlip WwTP** | **85,311** | **86,969** | **129,504** | **131,251** | **133,044** | **142,884** | **143,599** | **144,322** | **145,052** | **145,789** | **146,534** | **147,286** | **148,045** | **148,812** | **149,587** | **150,370** | **151,160** | **151,958** | **152,765** | **153,579** | **154,401** | **155,232** | **156,071** | **156,919** | **157,774** | **158,639** | **159,512** | **160,394** | **161,284** | **162,184** | **163,092** | **164,010** | **164,937** | **165,873** | **166,818** | **167,773** | **168,737** | **169,711** | **170,695** | **171,689** |

Leixlip WwTP

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Treatment Capacity** | 80,000 | 80,000 | 80,000 | 80,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 |
| Growth Scenario 1 | 85,311 | 86,969 | 129,504 | 131,251 | 154,411 | 164,251 | 166,140 | 168,079 | 170,069 | 202,111 | 204,208 | 206,360 | 208,568 | 210,835 | 213,162 | 215,550 | 218,001 | 220,517 | 223,100 | 225,750 | 228,471 | 231,263 | 234,129 | 237,071 | 240,090 | 243,189 | 246,370 | 249,635 | 252,986 | 256,426 | 259,956 | 263,580 | 267,299 | 271,116 | 275,034 | 279,056 | 283,184 | 287,421 | 291,769 | 296,233 |
| Growth Scenario 2 | 85,311 | 86,969 | 129,504 | 131,251 | 154,411 | 164,251 | 165,560 | 166,894 | 168,251 | 184,634 | 186,042 | 187,476 | 188,393 | 189,321 | 190,260 | 191,209 | 192,169 | 193,141 | 194,123 | 195,117 | 196,123 | 197,139 | 198,168 | 199,208 | 200,261 | 201,325 | 202,402 | 203,491 | 204,592 | 205,707 | 206,834 | 207,974 | 209,127 | 210,293 | 211,473 | 212,667 | 213,874 | 215,095 | 216,330 | 217,579 |
| Growth Scenario 3 | 85,311 | 86,969 | 129,504 | 131,251 | 133,044 | 142,884 | 143,599 | 144,322 | 145,052 | 145,789 | 146,534 | 147,286 | 148,045 | 148,812 | 149,587 | 150,370 | 151,160 | 151,958 | 152,765 | 153,579 | 154,401 | 155,232 | 156,071 | 156,919 | 157,774 | 158,639 | 159,512 | 160,394 | 161,284 | 162,184 | 163,092 | 164,010 | 164,937 | 165,873 | 166,818 | 167,773 | 168,737 | 169,711 | 170,695 | 171,689 |

**Note:** Average Daily Loading on Leixlip WwTP for Q1 2011 is reported by KCC as 2,727kg/day equivalent to 45,450 PE

Average daily loading from Intel in 2010 was 295kg/day equivalent to 4,916 PE




| Leixlip WwTP - Transfers to Regional WwTP | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Treatment Capacity - Leixlip WwTP** | 80,000 | 80,000 | 80,000 | 80,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 |
| Growth Scenario 1 Load Transfers | 0 | 0 | 0 | 0 | 0 | 14,251 | 16,140 | 18,079 | 20,069 | 52,111 | 54,208 | 56,360 | 58,568 | 60,835 | 63,162 | 65,550 | 68,001 | 70,517 | 73,100 | 75,750 | 78,471 | 81,263 | 84,129 | 87,071 | 90,090 | 93,189 | 96,370 | 99,635 | 102,986 | 106,426 | 109,956 | 113,580 | 117,299 | 121,116 | 125,034 | 129,056 | 133,184 | 137,421 | 141,769 | 146,233 |
| Growth Scenario 2 Load Transfers | 0 | 0 | 0 | 0 | 0 | 14,251 | 15,560 | 16,894 | 18,251 | 34,634 | 36,042 | 37,476 | 38,393 | 39,321 | 40,260 | 41,209 | 42,169 | 43,141 | 44,123 | 45,117 | 46,123 | 47,139 | 48,168 | 49,208 | 50,261 | 51,325 | 52,402 | 53,491 | 54,592 | 55,707 | 56,834 | 57,974 | 59,127 | 60,293 | 61,473 | 62,667 | 63,874 | 65,095 | 66,330 | 67,579 |
| Growth Scenario 3 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,160 | 1,958 | 2,765 | 3,579 | 4,401 | 5,232 | 6,071 | 6,919 | 7,774 | 8,639 | 9,512 | 10,394 | 11,284 | 12,184 | 13,092 | 14,010 | 14,937 | 15,873 | 16,818 | 17,773 | 18,737 | 19,711 | 20,695 | 21,689 |

**Osberstown WwTP**

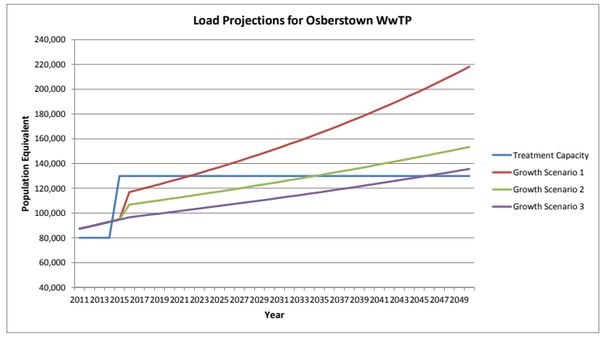
| Osberstown WwTP | Growth Rates (Scenario 1) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.20% (2006 - 2050) | **Population** | 65,977 | 67,428 | 68,912 | 70,428 | 71,977 | 73,561 | 75,179 | 76,833 | 78,524 | 80,251 | 82,017 | 83,821 | 85,665 | 87,550 | 89,476 | 91,444 | 93,456 | 95,512 | 97,613 | 99,761 | 101,955 | 104,198 | 106,491 | 108,834 | 111,228 | 113,675 | 116,176 | 118,732 | 121,344 | 124,013 | 126,742 | 129,530 | 132,380 | 135,292 | 138,268 | 141,310 | 144,419 | 147,596 | 150,844 | 154,162 |
| | 16% of Residential Population | **Commercial** | 10,556 | 10,789 | 11,026 | 11,268 | 11,516 | 11,770 | 12,029 | 12,293 | 12,564 | 12,840 | 13,123 | 13,411 | 13,706 | 14,008 | 14,316 | 14,631 | 14,953 | 15,282 | 15,618 | 15,962 | 16,313 | 16,672 | 17,039 | 17,413 | 17,796 | 18,188 | 18,588 | 18,997 | 19,415 | 19,842 | 20,279 | 20,725 | 21,181 | 21,647 | 22,123 | 22,610 | 23,107 | 23,615 | 24,135 | 24,666 |
| | 1.5% (2011 - 2050) | **Industrial** | 10,821 | 10,983 | 11,148 | 11,315 | 11,485 | 11,657 | 11,832 | 12,010 | 12,190 | 12,373 | 12,558 | 12,747 | 12,938 | 13,132 | 13,329 | 13,529 | 13,732 | 13,938 | 14,147 | 14,359 | 14,574 | 14,793 | 15,015 | 15,240 | 15,469 | 15,701 | 15,936 | 16,175 | 16,418 | 16,664 | 16,914 | 17,168 | 17,425 | 17,687 | 17,952 | 18,221 | 18,495 | 18,772 | 19,054 | 19,339 |
| | (reserved capacity) | **Industrial** | | | | | | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| | | **Total Osberstown WwTP** | **87,354** | **89,200** | **91,086** | **93,012** | **94,979** | **116,988** | **119,040** | **121,136** | **123,277** | **125,464** | **127,697** | **129,979** | **132,309** | **134,689** | **137,121** | **139,604** | **142,141** | **144,732** | **147,378** | **150,081** | **152,843** | **155,663** | **158,544** | **161,487** | **164,493** | **167,564** | **170,700** | **173,904** | **177,177** | **180,520** | **183,934** | **187,423** | **190,986** | **194,625** | **198,343** | **202,141** | **206,021** | **209,984** | **214,032** | **218,167** |

| Osberstown WwTP | Growth Rates (Scenario 2) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.20% (2006 - 2016); 1.15% (2017 - 2022); 1.15% (post 2022) | **Population** | 65,977 | 67,428 | 68,912 | 70,428 | 71,977 | 73,561 | 74,407 | 75,263 | 76,128 | 77,004 | 77,889 | 78,785 | 79,691 | 80,607 | 81,534 | 82,472 | 83,420 | 84,380 | 85,350 | 86,332 | 87,324 | 88,329 | 89,344 | 90,372 | 91,411 | 92,462 | 93,526 | 94,601 | 95,689 | 96,790 | 97,903 | 99,028 | 100,167 | 101,319 | 102,484 | 103,663 | 104,855 | 106,061 | 107,281 | 108,514 |
| | 16% of Residential Population | **Commercial** | 10,556 | 10,789 | 11,026 | 11,268 | 11,516 | 11,770 | 11,905 | 12,042 | 12,180 | 12,321 | 12,462 | 12,606 | 12,751 | 12,897 | 13,045 | 13,196 | 13,347 | 13,501 | 13,656 | 13,813 | 13,972 | 14,133 | 14,295 | 14,459 | 14,626 | 14,794 | 14,964 | 15,136 | 15,310 | 15,486 | 15,664 | 15,845 | 16,027 | 16,211 | 16,398 | 16,586 | 16,777 | 16,970 | 17,165 | 17,362 |
| | 1.25% (2011 - 2050) | **Industrial** | 10,821 | 10,956 | 11,093 | 11,232 | 11,372 | 11,514 | 11,658 | 11,804 | 11,952 | 12,101 | 12,252 | 12,405 | 12,561 | 12,718 | 12,877 | 13,037 | 13,200 | 13,365 | 13,532 | 13,702 | 13,873 | 14,046 | 14,222 | 14,400 | 14,580 | 14,762 | 14,946 | 15,133 | 15,322 | 15,514 | 15,708 | 15,904 | 16,103 | 16,304 | 16,508 | 16,715 | 16,923 | 17,135 | 17,349 | 17,566 |
| | (reserved capacity) | **Industrial** | | | | | | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | | **Total Osberstown WwTP** | **87,354** | **89,173** | **91,031** | **92,928** | **94,866** | **106,845** | **107,970** | **109,109** | **110,260** | **111,425** | **112,604** | **113,796** | **115,002** | **116,222** | **117,456** | **118,705** | **119,968** | **121,246** | **122,539** | **123,846** | **125,169** | **126,507** | **127,861** | **129,231** | **130,617** | **132,018** | **133,436** | **134,871** | **136,322** | **137,790** | **139,275** | **140,777** | **142,297** | **143,835** | **145,390** | **146,964** | **148,555** | **150,166** | **151,795** | **153,443** |

| Osberstown WwTP | Growth Rates (Scenario 3) | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.20% (2006 - 2016); 1.00% (post 2016) | **Population** | 65,977 | 67,428 | 68,912 | 70,428 | 71,977 | 73,561 | 74,297 | 75,039 | 75,790 | 76,548 | 77,313 | 78,086 | 78,867 | 79,656 | 80,452 | 81,257 | 82,070 | 82,890 | 83,719 | 84,556 | 85,402 | 86,256 | 87,119 | 87,990 | 88,870 | 89,758 | 90,656 | 91,562 | 92,478 | 93,403 | 94,337 | 95,280 | 96,233 | 97,195 | 98,167 | 99,149 | 100,140 | 101,142 | 102,153 | 103,175 |
| | 16% of Residential Population | **Commercial** | 10,556 | 10,789 | 11,026 | 11,268 | 11,516 | 11,770 | 11,887 | 12,006 | 12,126 | 12,248 | 12,370 | 12,494 | 12,619 | 12,745 | 12,872 | 13,001 | 13,131 | 13,262 | 13,395 | 13,529 | 13,664 | 13,801 | 13,939 | 14,078 | 14,219 | 14,361 | 14,505 | 14,650 | 14,796 | 14,944 | 15,094 | 15,245 | 15,397 | 15,551 | 15,707 | 15,864 | 16,022 | 16,183 | 16,345 | 16,508 |
| | 1.0% (2011 - 2050) | **Industrial** | 10,821 | 10,929 | 11,039 | 11,149 | 11,260 | 11,373 | 11,487 | 11,602 | 11,718 | 11,835 | 11,953 | 12,073 | 12,193 | 12,315 | 12,438 | 12,563 | 12,688 | 12,815 | 12,944 | 13,073 | 13,204 | 13,336 | 13,469 | 13,604 | 13,740 | 13,877 | 14,016 | 14,156 | 14,298 | 14,441 | 14,585 | 14,731 | 14,878 | 15,027 | 15,177 | 15,329 | 15,482 | 15,637 | 15,794 | 15,951 |
| | (reserved capacity) | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Total Osberstown WwTP** | **87,354** | **89,146** | **90,976** | **92,845** | **94,754** | **96,704** | **97,671** | **98,647** | **99,634** | **100,630** | **101,636** | **102,653** | **103,679** | **104,716** | **105,763** | **106,821** | **107,889** | **108,968** | **110,058** | **111,158** | **112,270** | **113,393** | **114,527** | **115,672** | **116,829** | **117,997** | **119,177** | **120,369** | **121,572** | **122,788** | **124,016** | **125,256** | **126,509** | **127,774** | **129,051** | **130,342** | **131,645** | **132,962** | **134,291** | **135,634** |

Osberstown WwTP

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment Capacity | 80,000 | 80,000 | 80,000 | 80,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 |
| Growth Scenario 1 | 87,354 | 89,200 | 91,086 | 93,012 | 94,979 | 116,988 | 119,040 | 121,136 | 123,277 | 125,464 | 127,697 | 129,979 | 132,309 | 134,689 | 137,121 | 139,604 | 142,141 | 144,732 | 147,378 | 150,081 | 152,843 | 155,663 | 158,544 | 161,487 | 164,493 | 167,564 | 170,700 | 173,904 | 177,177 | 180,520 | 183,934 | 187,423 | 190,986 | 194,625 | 198,343 | 202,141 | 206,021 | 209,984 | 214,032 | 218,167 |
| Growth Scenario 2 | 87,354 | 89,173 | 91,031 | 92,928 | 94,866 | 106,845 | 107,970 | 109,109 | 110,260 | 111,425 | 112,604 | 113,796 | 115,002 | 116,222 | 117,456 | 118,705 | 119,968 | 121,246 | 122,539 | 123,846 | 125,169 | 126,507 | 127,861 | 129,231 | 130,617 | 132,018 | 133,436 | 134,871 | 136,322 | 137,790 | 139,275 | 140,777 | 142,297 | 143,835 | 145,390 | 146,964 | 148,555 | 150,166 | 151,795 | 153,443 |
| Growth Scenario 3 | 87,354 | 89,146 | 90,976 | 92,845 | 94,754 | 96,704 | 97,671 | 98,647 | 99,634 | 100,630 | 101,636 | 102,653 | 103,679 | 104,716 | 105,763 | 106,821 | 107,889 | 108,968 | 110,058 | 111,158 | 112,270 | 113,393 | 114,527 | 115,672 | 116,829 | 117,997 | 119,177 | 120,369 | 121,572 | 122,788 | 124,016 | 125,256 | 126,509 | 127,774 | 129,051 | 130,342 | 131,645 | 132,962 | 134,291 | 135,634 |




| Osberstown WwTP - Load Transfers to Regional WwTP | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment Capacity - Osberstown WwTP | 80,000 | 80,000 | 80,000 | 80,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 | 130,000 |
| Growth Scenario 1 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 2,309 | 4,689 | 7,121 | 9,604 | 12,141 | 14,732 | 17,378 | 20,081 | 22,843 | 25,663 | 28,544 | 31,487 | 34,493 | 37,564 | 40,700 | 43,904 | 47,177 | 50,520 | 53,934 | 57,423 | 60,986 | 64,625 | 68,343 | 72,141 | 76,021 | 79,984 | 84,032 | 88,167 |
| Growth Scenario 2 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,018 | 3,436 | 4,871 | 6,322 | 7,790 | 9,275 | 10,777 | 12,297 | 13,835 | 15,390 | 16,964 | 18,555 | 20,166 | 21,795 | 23,443 |
| Growth Scenario 3 Load Transfers | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,645 | 2,962 | 4,291 | 5,634 |