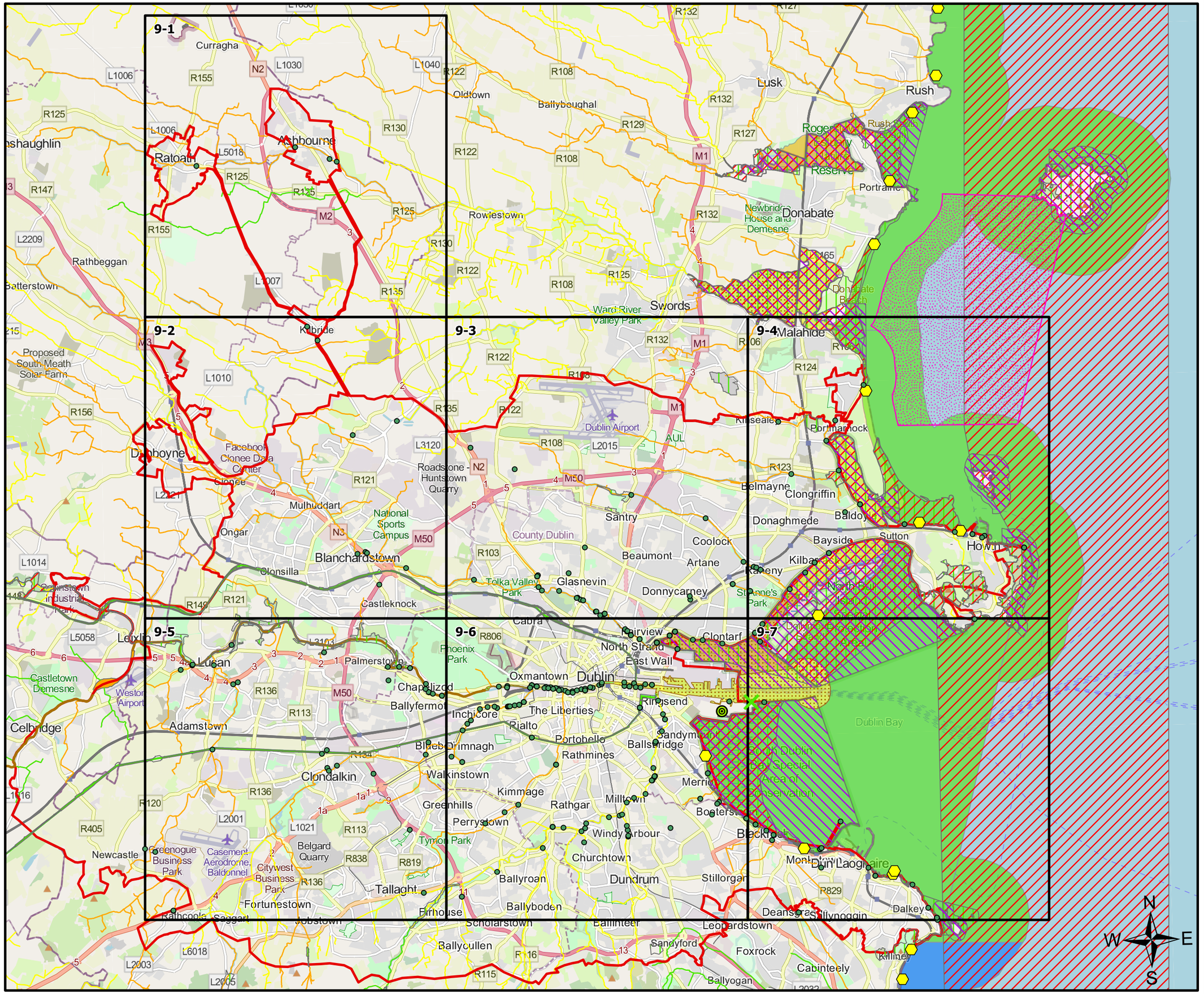
ATTACHMENT D.1:

MAP 9 - RECEIVING WATER DESIGNATIONS



NOTES:

Legend

- RINGSEND WWTP
- OVERFLOW LOCATIONS
- BATHING WATER LOCATIONS
- PRIMARY DISCHARGE LOCATION
- 10KM GRID SERIES
- SWD SHELLFISH WATERS
- SPA
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - RIVERS
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES
- AGGLOMERATION BOUNDARY

WFD RIVER/CANAL WATERBODY STATUS

- GOOD
- MODERATE
- POOR

WFD COASTAL WATERBODY STATUS

- GOOD
- HIGH
- MODERATE

WFD TRANSITIONAL WATERBODY STATUS

- GOOD
- MODERATE
- POOR

WFD LAKE WATERBODY STATUS

- POOR

SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9
RECEIVING WATER DESIGNATIONS MAP SERIES INDEX

SCALE	DRAWN	DATE
1:115,000	R. Clarke	06/03/2023

ATTACHMENT: D.1 | -

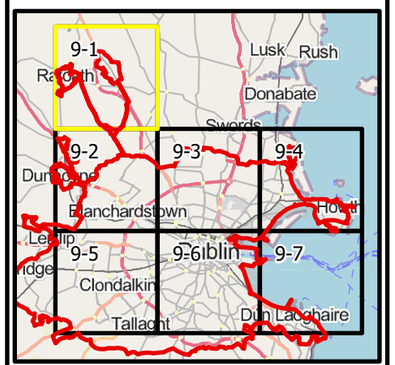
NOTES:

Legend

- OVERFLOW LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY

WFD RIVER WATERBODY STATUS

- GOOD
- MODERATE
- POOR



SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-1
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN
1:39,000	R. Clarke
	DATE 02/03/2023

ATTACHMENT: D.1 -

NOTES:

Legend

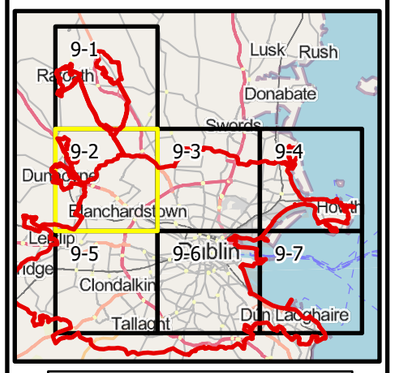
- OVERFLOW LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SAC
- PNHA

WFD CANAL WATERBODY STATUS

- GOOD
- NUTRIENT SENSITIVE AREAS - RIVERS

WFD RIVER WATERBODY STATUS

- MODERATE
- POOR



SIGNED:
PRINT NAME:
POSITION:
DATE:
FOR UISCE ÉIREANN

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT:

UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

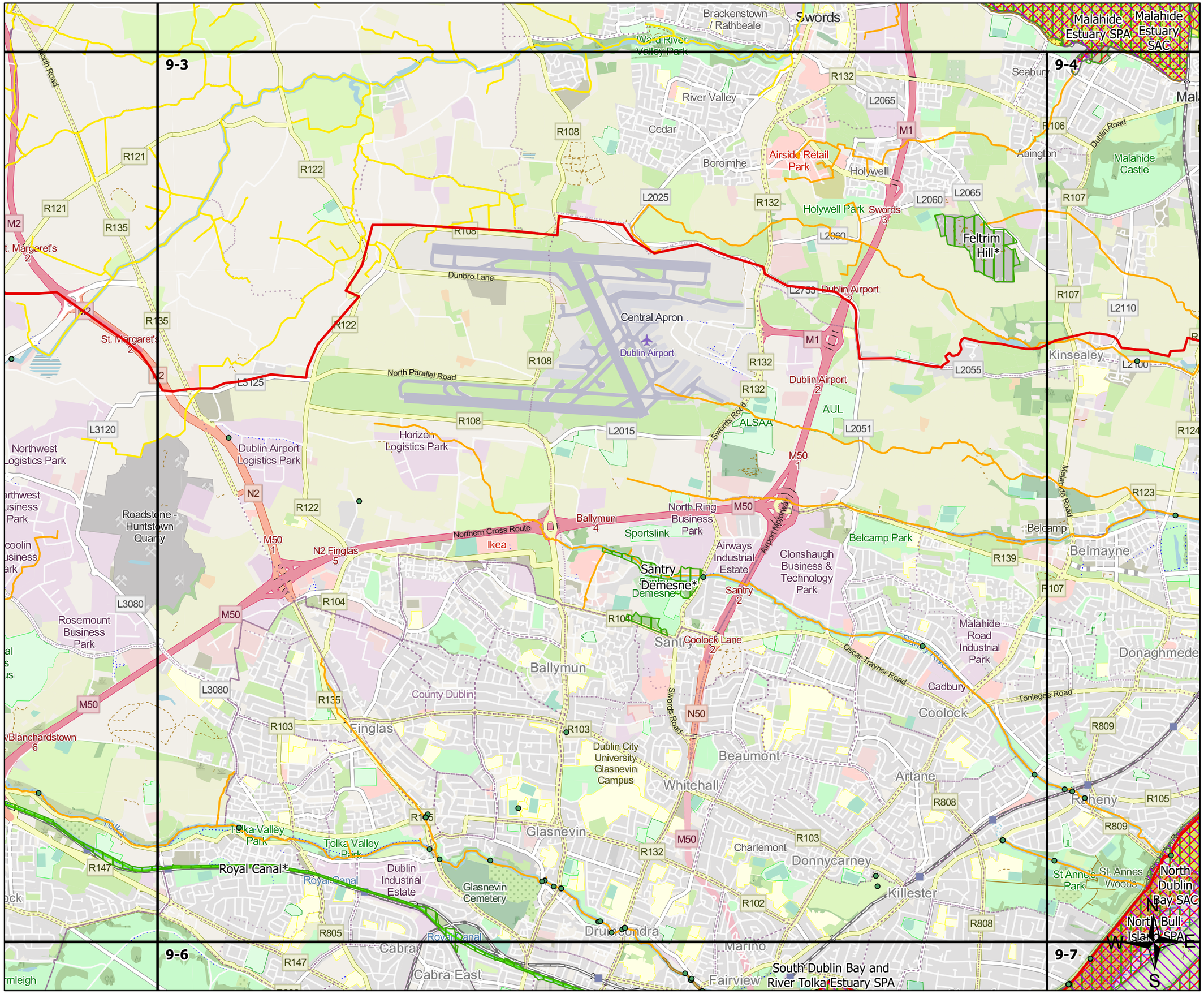
TITLE:

MAP 9-2

RECEIVING WATER DESIGNATIONS

SCALE	DRAWN
1:39,000	R. Clarke
	DATE 02/03/2023

ATTACHMENT: D.1 -



NOTES:

Legend

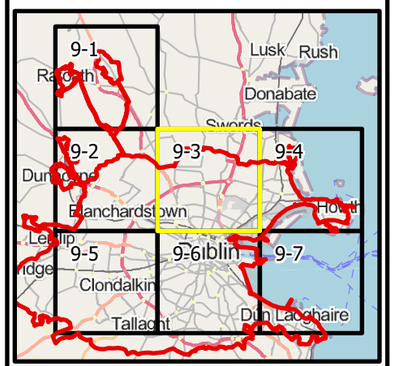
- OVERFLOW LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SPA
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES

WFD CANAL WATERBODY STATUS
- GOOD

WFD RIVER WATERBODY STATUS
- MODERATE
- POOR

WFD COASTAL WATERBODY STATUS
- MODERATE

WFD TRANSITIONAL WATERBODY STATUS
- MODERATE
- POOR



SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: Uisce Éireann Irish Water

UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-3
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN
1:39,000	R. Clarke
	DATE 02/03/2023

ATTACHMENT: D.1 -

NOTES:

Legend

- OVERFLOW LOCATIONS
- BATHING WATER LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SWD SHELLFISH WATERS
- SPA
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES

WFD RIVER WATERBODY STATUS

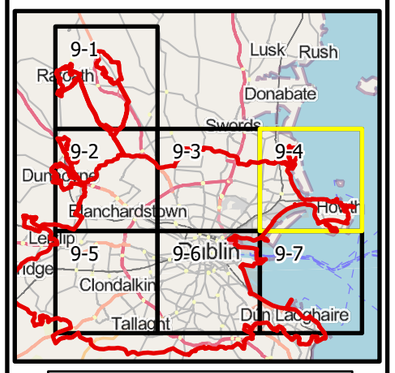
- MODERATE
- POOR

WFD COASTAL WATERBODY STATUS

- GOOD
- MODERATE

WFD TRANSITIONAL WATERBODY STATUS

- MODERATE
- POOR



SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

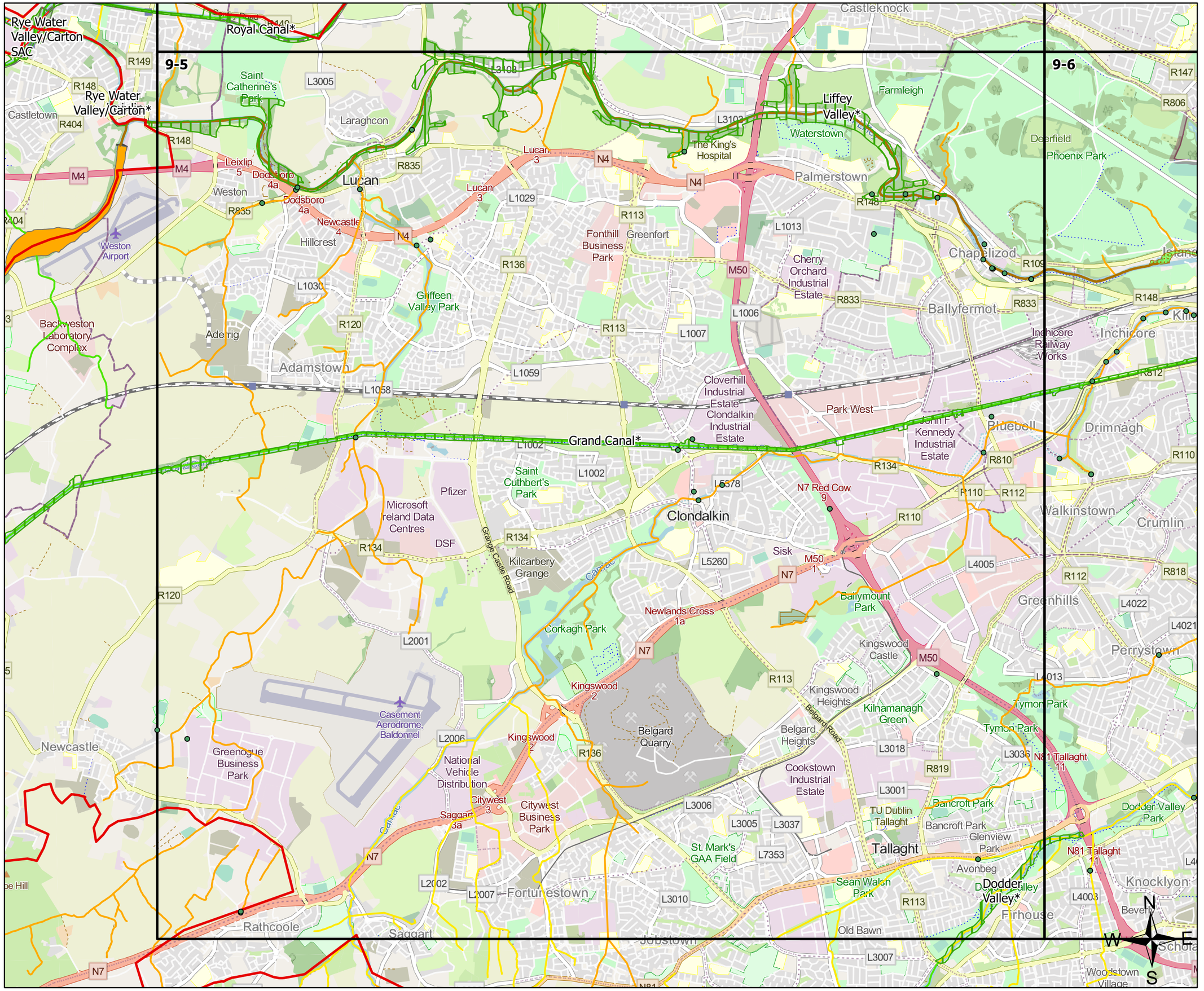
CLIENT: UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-4
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN
1:39,000	R. Clarke
	DATE 02/03/2023

ATTACHMENT: D.1 -



NOTES:

Legend

- OVERFLOW LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES

WFD CANAL WATERBODY STATUS
- GOOD
- NUTRIENT SENSITIVE AREAS - RIVERS

WFD RIVER WATERBODY STATUS
- GOOD
- MODERATE
- POOR

WFD TRANSITIONAL WATERBODY STATUS
- GOOD

WFD LAKE WATERBODY STATUS
- POOR

SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: Uisce Éireann Irish Water

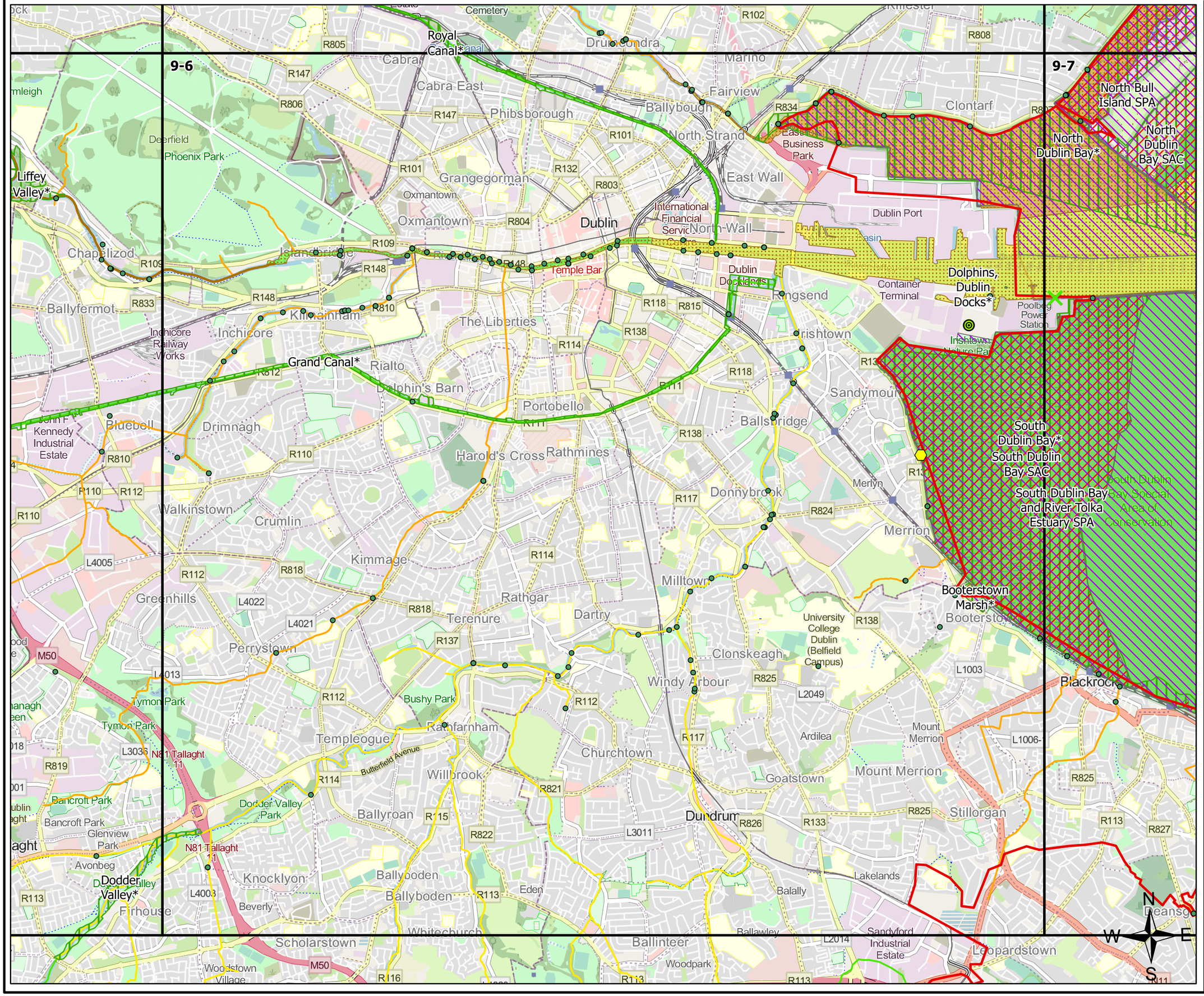
UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-5
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN	
1:39,000	R. Clarke	
	DATE	02/03/2023

ATTACHMENT: D.1 | -



NOTES:

Legend

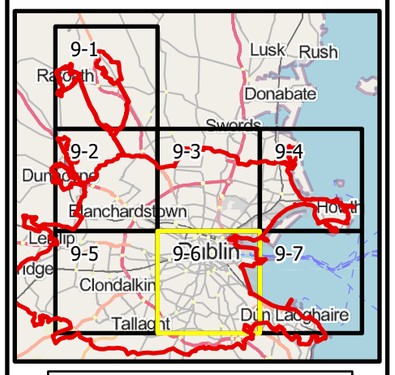
- RINGSEND WWTP
- OVERFLOW LOCATIONS
- PRIMARY DISCHARGE LOCATION
- BATHING WATER LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SPA
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES

WFD CANAL WATERBODY STATUS
- GOOD
- NUTRIENT SENSITIVE AREAS - RIVERS

WFD RIVER WATERBODY STATUS
- GOOD
- MODERATE
- POOR

WFD COASTAL WATERBODY STATUS
- GOOD

WFD TRANSITIONAL WATERBODY STATUS
- GOOD
- MODERATE
- POOR



SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-6
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN	
1:39,000	R. Clarke	
	DATE	02/03/2023

ATTACHMENT: D.1 -

NOTES:

Legend

- RINGSEND WWTP
- OVERFLOW LOCATIONS
- PRIMARY DISCHARGE LOCATION
- BATHING WATER LOCATIONS
- 10KM GRID INDEX
- AGGLOMERATION BOUNDARY
- SPA
- SAC
- PNHA
- NUTRIENT SENSITIVE AREAS - TRANSITIONAL WATERBODIES

WFD RIVER WATERBODY STATUS

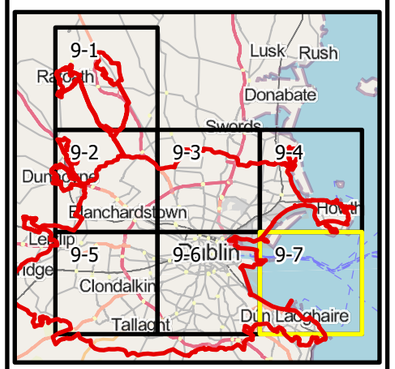
- GOOD
- MODERATE
- POOR

WFD COASTAL WATERBODY STATUS

- GOOD

WFD TRANSITIONAL WATERBODY STATUS

- MODERATE
- POOR



SIGNED:	
PRINT NAME:	
POSITION:	
DATE:	
FOR UISCE ÉIREANN	

Rev	Date	Description	Drn	Chk	App

DISCHARGE LICENCE

CLIENT: UISCE ÉIREANN
Colvill House,
24-26 Talbot Street,
Dublin 1
Tel. 1890 278 278 Web. www.water.ie

PROJECT: GREATER DUBLIN AREA AGGLOMERATION WASTE WATER DISCHARGE LICENCE APPLICATION

TITLE: MAP 9-7
RECEIVING WATER DESIGNATIONS

SCALE	DRAWN
1:39,000	R. Clarke
	DATE 02/03/2023

ATTACHMENT: D.1 -

ATTACHMENT D.2:

ASSESSMENT OF IMPACT ON RECEIVING WATERS

ATTACHMENT D.2.1:

IMPACT ASSESSMENT REPORT, MAY 2023

ATTACHMENT D.2.1: IMPACT ASSESSMENT REPORT

1. Introduction

This Report provides a summary of the Impact Assessments prepared to determine the impact of the discharges from the Greater Dublin Area Agglomeration on the receiving waterbodies, and their associated designations, and also addresses the criteria as outlined in Section D.2 of the EPA guidance document.

The water quality model prepared for the 2018 planning application is currently being updated to account for the latest available data and to include additional modelling scenarios (i.e., mass emissions limits and upper tier limits scenarios).

The updated modelling and impact assessment reports will provide scientific evidence to support the proposed Mass Emission Limits and condition 2 upper tier limits (as well as proposed concentration emission limit values (ELVs)). Upon completion, the results of the water quality modelling and updated impact assessment reports will be forwarded to the Agency, at which time Uisce Éireann will confirm the proposed mass emissions ELVs and condition 2 upper tier limits. Associated addendums to the 2018 Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) will also be completed and forwarded to the Agency.

Once complete, the enhanced treatment technology at the upgraded WwTP is expected to have a positive impact in terms of improved effluent quality being discharged to the receiving waterbodies.

2. Water Environment

There are several receiving waters hydrologically linked to the primary discharge (SW001). Details on these waterbodies are provided in **Table D.2.1** below.

Table D.2.1 – Waterbodies Hydrologically Linked to the Primary Discharge

Receiving Waterbody	Type of Waterbody	WFD Status 2016 – 2021 (where applicable)	WFD Risk (3rd cycle) (where applicable)	Bathing Water Status 2021 (where applicable)	Trophic Status 2018 - 2020 (where applicable)
Liffey Estuary Lower (IE_EA_090_0300)	Transitional	Moderate	At Risk	Not applicable	Intermediate
Liffey Estuary Upper (IE_EA_090_0400)	Transitional	Good	Review	Not applicable	Potentially Eutrophic
Tolka Estuary (IE_EA_090_0200)	Transitional	Poor	At Risk	Not applicable	Eutrophic
Dublin Bay (IE_EA_090_0000)	Coastal	Good	Not at Risk	Not applicable	Unpolluted
Dollymount Strand	Bathing	Not applicable	Not applicable	Good	Not applicable

Receiving Waterbody	Type of Waterbody	WFD Status 2016 – 2021 (where applicable)	WFD Risk (3rd cycle) (where applicable)	Bathing Water Status 2021 (where applicable)	Trophic Status 2018 - 2020 (where applicable)
(IEEABWC090_0000_0400)					
Sandymount Strand (IEEABWC090_0000_0300)	Bathing	Not applicable	Not applicable	Sufficient	Not applicable

The Greater Dublin Area Agglomeration is spread across three Hydrometric Areas (HA):

- Nanny-Delvin (HA 08)
- Liffey and Dublin Bay (HA 09)
- Ovoca-Vartry (HA 10)

Storm Water Overflows (SWOs) in the Greater Dublin Area agglomeration are identified as a significant pressure in fourteen (14 no.) *'At Risk'* waterbodies in the draft 3rd cycle Catchment Reports (2021) for HA 08 and HA 09. It is not identified as a significant pressure in the draft 3rd cycle Catchment Report (2021) for HA 10. Refer to **Table D.2.2** for details.

Table D.2.2: At Risk Waterbodies identified as being under significant pressure by the SWOs in the Greater Dublin Area Agglomeration (D0034) in the draft 3rd cycle Catchment Reports

Hydrometric Area	Waterbody	2016-2021 Ecological Status
Nanny-Delvin (08)	Broadmeadow_010	Poor
	Broadmeadow_020	Poor
	Ward_020	Moderate
	Ward_030	Moderate
Liffey & Dublin Bay (09)	Tolka Estuary	Poor
	Camac_040	Poor
	Dodder_050	Moderate
	Liffey_180	Poor
	Liffey_190	Poor
	Santry_010	Poor
	Santry_020	Poor

Hydrometric Area	Waterbody	2016-2021 Ecological Status
	Tolka_050	Poor
	Tolka_060	Poor
	Grand Canal Basin (Liffey and Dublin Bay)	Good

However, in the draft 3rd cycle catchment assessments for HA 08 and HA 09, it is noted that the overflows upgrades are included in Uisce Éireann's Capital Investment Programme.

The Ringsend WwTP was non-compliant with the ELVs set in the WWDL in 2022 and does have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries.

The primary discharge from the WwTP does not have an observable negative impact on the Water Framework Directive status in the Liffey Estuary and Dublin Bay (Source: TRaC Data 2022). Refer to **Attachment D.2.3**. It should be noted that other potential causes of deterioration in water quality relevant to this area are upstream riverine pollutants, combined sewer overflows, exfiltration from sewers and misconnections to surface water sewers in the large urban agglomeration.

It is considered that the provision of the upgraded WwTP with N & P removal and the resultant improvements in nutrient loading to the receiving waterbodies, will contribute to the WFD Objectives being met / maintained in the receiving waterbodies.

There are several designations within the vicinity of the primary discharge from the Greater Dublin Area Agglomeration. These are detailed below.

The primary discharge enters directly into the Liffey Estuary which is identified as a Nutrient Sensitive Area (N and P limited) in accordance with the UWWTD 91/271/EEC on Urban Waste Water Treatment and S.I. No. 254 of 2001, S.I. No. 440 of 2004 and S.I. No. 48 of 2010. The Tolka Estuary Nutrient Sensitive Area (N limited in summer and P limited in winter) is located *ca*. 1km north of the primary discharge location. Based on these designations, along with the fact that the p.e of the agglomeration is greater than 100,000, the existing TP ELV of 1mg/l and TN ELV of 10mg/l is proposed to be maintained.

There are two bathing waters in Dublin Bay designated under EU Directive 2006/7/EC and Bathing Water Quality Regulations, S.I. No. 79 of 2008 which are in the vicinity of the primary discharge. These are Dollymount Strand and Sandymount Strand. Dollymount Bathing Water Area is located *ca.* 1.8km north east of the primary discharge and was classified as achieving Good Water Quality in 2021 based on the assessment of bacteriological results for the period 2018 - 2021. Sandymount Bathing Water Area is located *ca*. 1.5km south west of the primary discharge and was classified as achieving Sufficient Water Quality in 2021 based on the assessment of bacteriological results for the period 2018 - 2021. A Bathing Water Profile was prepared for Dollymount Strand in 2021 which identified that during exceptional circumstances (*e.g.,* heavy rainfall / overflows from the storm tank / mechanical breakdowns), the Ringsend WwTP discharge may contain elevated levels of microbiological contaminants which could pose a "*High*" risk. Pumping station failures / malfunctions at Clontarf, Vernon Avenue and Kilbarrack were identified as posing a "*High*" risk. Storm Water Overflows were also identified as posing a "*Moderate*"

risk. A Bathing Water Profile was prepared for Sandymount Strand in 2022 which identified that during exceptional circumstances (*e.g.*, heavy rainfall / overflows from the storm tank / mechanical breakdowns), the Ringsend WwTP discharge may contain elevated levels of microbiological contaminants which could pose a "*High*" risk. Pumping station failures / malfunctions at Ailesbury Pumping Station were also identified as posing a "*High*" risk. Storm Water Overflows were identified as posing a "*High*" risk. The provision of upgrades to the WwTP alongside the provision of UV disinfection process during the bathing season will assist in alleviating the risks which are currently assigned to the water quality at Dollymount Strand and Sandymount Strand.

There are no designated shellfish areas within Dublin Bay. The closest designated shellfish area is Malahide Shellfish Area, which is located *ca*. 10.5km north east of the primary discharge point. The water quality model prepared for the 2018 planning application predicts that the plume will disperse away from the discharge point and dilution will occur within short distances of the outfall. The reduction in nutrient levels is too low to impact on shellfish species in the area outside the North and South Walls. Updated water quality modelling is being completed at the time of this Review Application and will be forwarded on to the Agency.

There are no designated salmonid river bodies upstream or downstream of the primary discharge location. The water quality model prepared for the 2018 planning application predicts that the reduction in nutrient levels is too low to impact on fish species in the area outside the North and South Walls. Updated water quality modelling is being completed at the time of this Review Application and will be forwarded on to the Agency.

There are a number of European sites within the primary outfalls zone of influence or within 10km of the WwTP. All of these sites are located wholly or partially within Dublin Bay, they include:

- South Dublin Bay and River Tolka Estuary SPA (site code 004024) (*ca*. 0.2km East)
- South Dublin Bay SAC (000210) (*ca*. 0.2km East)
- North Bull Island SPA (004006) (*ca*. 1.8km North East)
- North Dublin Bay SAC (000206) (*ca*. 1.8km North East)
- Howth Head SAC (000202) (*ca.* 6.6km North East)
- Howth Head Coast SPA (004113) (*ca*. 9.1km North East)
- Dalkey Islands SPA (004172) (*ca*. 9km South East)
- Rockabill to Dalkey Island SAC (003000) (*ca*. 6.2km East)

Refer to **Section 4** below for details on Appropriate Assessment.

The pNHAs and NHAs within the surrounding environment include:

- South Dublin Bay pNHA (000210) (*ca*. 0.2km East)
- Dolphins, Dublin Docks pNHA (000201) (*ca*. 0.6km West)
- North Dublin Bay pNHA (000206) (*ca*. 1.1km North East)
- Howth Head pNHA (000202) (*ca*. 6.6km North East)
- Grand Canal pNHA (002104) (*ca*. 3.2km West)
- Royal Canal pNHA (002103) (*ca*. 3.8km West)

Ramsar sites within the surrounding environment include:

- North Bull Island (*ca.* 4km North East)
- Sandymount Strand/Tolka Estuary (*ca.* 1.2km South)
- Baldoyle Bay (*ca.* 8.4km North East)
- Broadmeadow Estuary (Malahide) (*ca.* 13.6km North)

Refer to **Attachment B.5** for a copy of the Environmental Impact Assessment Report (2018) and **Attachment D.2.2** for a copy of the Natura Impact Statement (2018) for further details on the receiving environment.

3. Water Quality Modelling

The water quality model prepared for the 2018 planning application is currently being updated to account for the latest available data and to include additional modelling scenarios (i.e., mass emissions limits and upper tier limits scenarios).

The updated modelling and impact assessment reports will provide scientific evidence to support the proposed Mass Emission Limits and condition 2 upper tier limits (as well as proposed concentration ELVs). Upon completion, the results of the water quality modelling and updated impact assessment reports will be submitted to the Agency, at which time Uisce Éireann will confirm the proposed mass emissions ELVs and condition 2 upper tier limits.

4. Appropriate Assessment

As listed in **Section 2** above, there are a number of European sites within the primary outfalls zone of influence or within 10km of the WwTP.

A combined Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS) Report supported the 2018 planning application for the Ringsend WwTP upgrade. Based on the revised water quality modelling which is currently being undertaken based on the latest available data, an addendum to the 2018 NIS will be completed and forwarded to the Agency. These documents will enable the EPA as competent authority to conduct an AA Screening Determination and Stage 2 AA in respect of the Greater Dublin Area Agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

Please refer to **Attachment D.2.2** for a copy of the Natura Impact Statement. Also refer to **Attachment B.3.8** for a copy of the 2019 An Bord Pleanála Inspector's Report.

5. Environmental Impact Assessment

This WWDA application review is for a WwTP with a capacity of greater than 10,000 p.e as defined in Article 2, point (6), of the Urban Waste Water Treatment Directive (*i.e.*, Ringsend 2.4 million p.e). Therefore, a mandatory EIA, and the preparation of an Environmental Impact Assessment Report (EIAR) is required to inform the WWDA process.

The EIAR prepared in 2018 for the WwTP upgrade includes an assessment of the operational discharges from the WwTP to the receiving waters as detailed in **Section 2** above.

The approach adopted in this impact assessment, and the overall preparation of the EIAR, was based on the EIA Directive 2014/52/EU, and took account of all relevant guidance documents published at the time of preparing the EIAR. Due regard was also taken of the scoping responses received during the EIA Scoping Process.

The EIAR concluded that the primary discharge from the Ringsend WwTP would not be likely to have significant effects on the environment.

Based on the revised water quality modelling which is currently being undertaken based on the latest available data, an addendum to the 2018 EIAR will be completed and forwarded to the Agency.

These documents will enable the EPA, as the Competent Authority, to conduct an EIA in respect of the Greater Dublin Area Agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

Refer to **Attachment B.5.1** for a copy of the EIAR (2018).

6. Priority Substance Assessment Report

Monitoring of priority substances in the primary discharge is carried out annually in accordance with the existing WWDL (D0034-01). The assessment considers the primary discharge relevant to Environmental Quality Standards (EQS) for priority substances in surface waters, as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended. Based on the 2022 monitoring results, priority substances detected in effluent should have no negative impacts outside the near field of the discharge due to dilution.

This Report is contained in **Attachment D.2.4**: Ringsend Influent and Effluent Priority Substances Screening 2022.

7. Shellfish Waters

There are no designated shellfish areas within Dublin Bay. Due to the quality of water in the inner parts of Dublin Bay and the Liffey, consumption of shellfish from the area can only occur following depuration. For this reason, no shellfish are collected in this part of Inner Dublin Bay. The closest designated shellfish area is Malahide Shellfish Area, which is located *ca*. 10.5km north east of the primary discharge point. The water quality model prepared for the 2018 planning application predicts that the plume will disperse away from the discharge point and dilution will occur within short distances of the outfall. The reduction in nutrient levels is too low to impact on shellfish species in the area outside the North and South Walls. Updated water quality modelling is being completed at the time of this Review Application and will be forwarded on to the Agency.

Refer to **Attachment B.5** for a copy of the EIAR (2018).

8. Bathing Waters

As noted in **Section 2**, there are two (2 no.) bathing water areas in the vicinity of the primary discharge. These are Dollymount Strand and Sandymount Strand. Dollymount Bathing Water Area is located *ca.* 1.8km north east of the primary discharge and was classified as achieving Good Water Quality in 2021 based on the assessment of bacteriological results for the period 2018 - 2021. Sandymount Bathing Water Area is located *ca*. 1.5km south west of the primary discharge and was classified as achieving

Sufficient Water Quality in 2021 based on the assessment of bacteriological results for the period 2018 - 2021.

The upgrades to the WwTP will assist in alleviating the risks which are currently assigned to the water quality at Dollymount Strand and Sandymount Strand.

9. Combined Approach

The Waste Water Discharge Authorisation under the European Union (Waste Water Discharge) Regulations 2007 to 2020, specify that a '*combined approach'* in relation to licensing of waste water works must be taken, whereby the emission limits for the discharge are established on the basis of the stricter of either or both, the limits and controls required under the Urban Waste Water Treatment Regulations, 2001, as amended, and the limits determined under statute or Directive for the purpose of achieving the environmental objectives established for surface waters, groundwater or protected areas for the water body into which the discharge is made.

The design of the WwTP is greater than 15,000 p.e and is therefore in line with Article 4 of the directive, "*Member States shall ensure that urban waste water entering a collecting system shall before discharge be subject to secondary treatment or an equivalent treatment for all discharges from agglomerations of more than 15,000 p.e*". The upgraded WwTP provides for secondary treatment, with N & P removal.

The ELVs as set out in this licence review for the upgraded WwTP give effect to the principle of the Combined Approach as defined in Waste Water Discharge (Authorisation) Regulations, 2007 to 2020 in that they accommodate the Urban Waste Water Regulations and the relevant designations / status of the receiving waterbodies.

10. Compliance with Relevant National or EU Legislation

As per **Attachment B.6**, the Ringsend WwTP has been designed to ensure that the emissions from the agglomeration will comply with, and will not result in the contravention of, EU Legislation and National Regulations.

The proposed ELVs, along with the operation of the agglomeration overflows as detailed in this review application will ensure that the operational discharges from the Greater Dublin Area agglomeration contribute towards achieving / maintaining at least Good status of the applicable receiving waterbodies by 2027, thereby ensuring compatibility with achievement of the WFD objectives of the receiving waters.

The discharge activities will not cause a deterioration in the chemical status in the relevant receiving waterbody and will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats, or any other designations.

11. Data Sources

The following data sources were used to complete this application.

- Online data available on held by the NPWS, the EPA and Uisce Éireann:
    - www.npws.ie
    - epawebapp.epa.ie

- gis.epa.ie/EPAMaps
- catchments.ie

- GIS data for European site boundaries obtained in digital format online from European Environmental Agency
- Uisce Éireann / Dublin City Council Authority Monitoring & Sampling Data

12. Cumulative and In Combination Effects

The combined AA Screening and NIS Report (May 2018), and the EIAR (June 2018) address cumulative and in-combination effects. Refer to **Attachment B.5** for a copy of the EIAR (2018). Refer to **Attachment D.2.2** for a copy of the NIS.

13. Dilutions and retention times for lakes

Not applicable. No discharges to lakes.

14. The impact of the discharges on any environmental media other than those into which the emissions are to be made

Not applicable. No other relevant media into which the emissions are to be made.

15. Groundwater Details

Not applicable. No discharge to ground waters.

16. High Status Waterbodies

Not applicable. No High status waterbodies within the region of the Ringsend WwTP and/or the operational discharges.

17. Fresh Water Pearl Mussels

Not applicable. No Fresh Water Pearl Mussels within the region of the Greater Dublin Area Agglomeration WwTW.

18. Impacts on Transboundary / Territory of other States

The operational discharges to which this application relates will not result in transboundary impacts or impacts on the territory of other states.

19. For waste water treatment plants with coastal discharges, provide evidence that the end of the discharge pipe is below the mean spring tide low water line

Not applicable. The primary discharge point (SW001) discharges to the Liffey Estuary Lower which is a transitional waterbody.

ATTACHMENT D.2.3:

2022 AMBIENT MONITORING SUMMARY

D.2.3 – 2022 AMBIENT MONITORING SUMMARY- RINGSEND WWTP

The results for ambient results and additional monitoring data sets are included at the end of this document.

Significance of Results:

- The Ringsend WWTP was non-compliant with the ELV's set in the wastewater discharge licence.
- The primary discharge from the wastewater treatment plant does have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries.
- The primary discharge from the WWTP does not have an observable negative impact on the Water Framework Directive status in the Liffey Estuary.
- Other potential causes of deterioration in water quality relevant to this area are upstream riverine pollutants, combined sewer overflows, exfiltration from sewers and misconnections to surface water sewers in the large urban agglomeration.

Licence D0034-01 requires monitoring and assessment of the impacts of the Ringsend effluent discharge on receiving water quality at agreed sampling locations as follows:

- 9 Ambient Surface Waters (**ASW2 to ASW10**) covering sampling points in the lower Liffey Estuary in the near field of the discharge (**ASW2 to ASW5**), and points on the River Liffey and River Tolka (**ASW6 to ASW10 - Surface and Depth samples**)
- 11 additional monitoring points on the Liffey and Tolka Estuaries (**DB 020 to DB 420 – Surface, Depth and Composite samples**)
- 9 monitoring locations in Dublin Bay (**DB 430 to DB 610 – Surface, Depth and Composite samples**)
- 8 shoreline locations, 2 of which are EC designated bathing waters - Dollymount Bathing Zone and Sandymount (**ASW 11 to ASW 18**)

See all monitoring data for 2022 at the end of this document.

The Liffey Estuary from Islandbridge Weir to the Poolbeg Lighthouse including the River Tolka Basin and the South Bull Lagoon is designated as a "*sensitive area*" by Part 2, Schedule 3, of the Urban Wastewater Regulations, SI 254 of 2001. S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019, set physico-chemical standards for High and Good status in transitional and coastal water bodies to be complied with outside the allocated mixing zone of a licensed discharge.

The Rivers Liffey and Tolka and their estuaries are classified under the Water Framework Directive as Transitional Water Bodies. The outer estuary / Dublin Bay is classified as a Coastal Water Body.

The parameter suite set in the marine monitoring section of the licence was tested in all samples (Temperature / Dissolved Oxygen / BOD / Salinity / Dissolved Inorganic Nitrogen / Total Oxidised Nitrogen / Molybdate Reactive Phosphate / Ammonia / Silica / Chlorophyll).

Tidal Conditions during the 6 monthly estuarine surveys in **2022** are tabulated below:

Survey No. and Month 2022	Date	High Tide Time	Height (m OD)	Low Tide Time	Height (m OD)	Tidal Status during Survey
1. April	28/04/22	11.05	3.89	16.51	0.59	High to Ebb
2. May	26/05/22	09.42	3.78	15.36	0.85	High to Ebb
3. June	23/06/22	08.06	3.71	14.03	1.06	Mid Ebb to Low
4. July	13/07/22	11.57	4.01	17.36	0.67	High to Mid-Ebb
5. August	25/08/22	11.37	3.56	17.19	1.22	High to Mid-Ebb
6. September	21/09/22	09.42	3.27	15.37	1.64	High to Ebb

1.1 Marine Monitoring Summary – ASW2 to ASW10

A total of 6 surveys were carried out in the Liffey and Tolka Estuaries during 2022 at the designated locations in the licence, tabulated below:

EPA Map Code	Licence Code	Sampling Point
		Liffey Estuary Lower
	ASW2	25 metres North of Poolbeg Wall
	ASW3	50 metres North of Poolbeg Wall
	ASW4	75 metres North of Poolbeg Wall
	ASW5	100 metres North of Poolbeg Wall
		Liffey
DB000	**ASW6**	Liffey City, Downstream Islandbridge Weir
DB010	**ASW7**	Liffey City, Heuston Station, Upstream of Camac Outfall
	ASW8	Liffey City, Winetavern Street Bridge
		Liffey Estuary Lower
DB210	**ASW9**	Liffey (Surface), Downstream of East Link Toll Bridge
		Tolka
DB310	**ASW10**	Tolka, Downstream of Annesley Bridge

A summary of transitional water quality compliance with S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019 for the above locations is presented below and complete water quality data is presented at the end of this document.

BOD values were compliant with transitional water quality at all locations and on all dates except for:

- ASW 2S – on 28/04/22 (BOD = 6 mg/l) and on 23/06/22 (BOD = 4mg/l)
- ASW 3S - on 28/04/22 (BOD = 6 mg/l)
- ASW 8S – on 28/04/22 (BOD = 4 mg/l)

Median Chlorophyll values were compliant with transitional water quality at all locations except for:

- ASW 10S – (7.8 mg/m^3)

Data showed compliance with Temperature, Dissolved Oxygen (lower) and Dissolved Oxygen (upper) at all locations on all survey dates except for:

- **ASW 10S** - on 23/06/22 (DO Lower = 68% Sat.)

Exceedances of median Molybdate Reactive Phosphate (MRP) standards occurred in the near field of the Ringsend discharge at ASW2, ASW3, ASW4 and at ASW 10S (Surface samples).

The non-compliant median MRP results were as follows:

Location	MRP 2022 Median Result	S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019 Standard	Comment
		60 ug/l as P (median) at 0-17% PSU to 40 ug/l as P (median) at 35% PSU	
ASW2 (Surface)	262.5 ug/l as P		Close to SW1 Outfall within the Mixing Zone
ASW3 (Surface)	170.5 ug/l as P		Close to SW1 Outfall within the Mixing Zone
ASW4 (Surface)	72.5 ug/l as P		Close to SW1 Outfall within the Mixing Zone
ASW10 (Surface)	91 ug/l as P		Outside the Mixing Zone Upstream River Pollution

1.2 Marine Monitoring – 2022 - Transitional Water Monitoring – Points Agreed with the EPA (DB 020 to DB 420)

A total of 6 surveys were carried out in the Liffey and Tolka Estuaries during 2022, at 11 locations agreed with the EPA, tabulated below:

EPA Map Code	Sampling Point
	Liffey Estuary Upper
DB 020	Matt Talbot Bridge
	Liffey Estuary Lower
DB 120	Dodder / Grand Canal Basin
DB 210	East Link Toll Bridge
DB 220	RO RO Ramp No.5 (Old Treatment Works Outfall)
DB 410	Ringsend Cascade
DB 420	Poolbeg Lighthouse
	Tolka
DB 300	Upstream of Drumcondra Bridge
	Tolka Estuary
DB 320	East Point Business Park Bridge
DB 330	Castle Avenue
DB 340	Clontarf Boat Club
DB 350	South Lagoon at Bull Wall Wooden Bridge

A summary of transitional water quality compliance with S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019 for the above locations is presented below and the complete water quality data is presented at the end of this document.

These surveys showed full compliance with BOD, Temperature, Dissolved Oxygen (upper and lower) and Median Reactive Phosphorus at all locations, on all survey dates except those detailed below.

BOD Saline results exceeded the limit of < 4 mg/l O_2 at:

- **DB 410 (Surface)** on 28/04/2022 **(4 mg/l)**
- **DB 320 (Depth)** on 28/04/2022 **(4 mg/l)** and 25/08/2022 **(5 mg/l)**

Median Chlorophyll was noted as follows:

- **DB 020 (Depth) – 5.5 mg/m^3**

- **DB 300 (Surface) – 6.3 mg/m^3**
- **DB 320 (Surface) – 5.2 mg/m^3**
- **DB 350 (Composite) – 5.3 mg/m^3**

Molybdate Reactive Phosphate (MRP) median exceedances occurred at locations as follow:

Location	MRP 2022 Median Result	S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019	Comment
		< 40ug/l P(med) < 60 ug/l P (med)	
	Tolka		
DB 300 (Surface)	**61.2 ug/l P**		Upstream riverine impacts
	Tolka Estuary		
DB320 (Surface)	**80 ug/l P**		SW1 Discharge and riverine impacts
DB320 (Depth)	**73 ug/l P**		SW1 Discharge and riverine impacts
DB330 (Surface)	**75 ug/l P**		SW1 Discharge and riverine impacts
DB330 (Depth)	**63 ug/l P**		SW1 Discharge and riverine impacts
DB330 (Composite)	**106 ug/l P**		SW1 Discharge and riverine impacts
DB350 (Composite)	**61.5 ug/l P**		SW1 Discharge and riverine impacts

1.3 Marine Monitoring – Dublin Bay, 2022- Points Agreed with the EPA

A total of 4 surveys were carried out at 9 locations in Dublin Bay during 2022 These locations – 6 coastal waters and 3 Irish Sea locations (*), as agreed with the EPA, are tabulated below:

EPA Map Code	Coastal Water Sampling Points
	Dublin Bay
DB 610	Off Bailey Lighthouse, Howth
DB 430	1 km. NE Poolbeg Lighthouse
DB 450	South Bull Buoy, 1 km. SE Poolbeg Lighthouse
DB 510*	2.5 km. ENE Poolbeg Lighthouse
DB 540*	2.5 km. SSE Poolbeg Lighthouse
DB 550	No.4 Buoy, 2.5 km. E of S Poolbeg Lighthouse
DB 560	Drumleck Point, Howth, 5 km. ENE Poolbeg Lighthouse
DB 570*	5 km. ESE Poolbeg Lighthouse
DB 580	Dun Laoghaire, 5 km. E of S Poolbeg Lighthouse

All monitoring data is included at the end of this document.

These locations were sampled at surface (S) and depth (D) only when the Salinity varied on the recommendation of the EPA. Composite samples (C) were taken at all other times.

A summary of coastal water quality compliance with S.I. No. 272 of 2009 (as amended) / S.I. No. 77 of 2019 for the above locations is presented below and complete water quality data is presented at the end of this document.

Monitoring data for 2022 shows full compliance with Temperature, Dissolved Oxygen (lower) and Dissolved Oxygen (upper).

The median Chlorophyll Good to Moderate limit (< 5.0 ug/l) was complied with at all 9 sampling locations in 2022.

The Dissolved Inorganic Nitrogen (DIN) standards for coastal waters (High Status) were complied with at all 9 of the sampling locations on all survey dates.

There were **no other measured impacts** on regulated coastal and Irish Sea water quality during 2022.

1.4 Shoreline Monitoring – 2022 Bathing Season

Bathing Water is currently regulated by the Bathing Water Quality Regulations, 2008 (S.I. No.79 of 2008) and Bathing Water Quality (Amendment) Regulations 2011 (S.I. No. 351 of 2011).

Shoreline sampling was carried out at 8 locations during the 2022 bathing season:

- ASW 11 - Dollymount North,
- **ASW 12 - Dollymount Bathing Zone***
- ASW 13 - Dollymount South
- ASW 14 - Bull Wall Wood Causeway
- ASW 15 - Poolbeg Outfall (Main)**
- ASW 16 - Half Moon Club Southside
- **ASW 17 – Sandymount Strand***
- ASW 18 – Merrion Strand (All season bathing restriction came into place in 2020 due to Poor water quality. It had been classified as Poor status for five consecutive years (2015 to 2019).

**Note that Point ASW 15 - Poolbeg Outfall - is not a bathing area and is monitored to check the impact of the Ringsend discharge plume.

A summary of bathing water quality compliance for the above locations, two of which are designated* is presented below and complete water quality data is presented at the end of this document.

In Summary:

Bathing water status is determined by the EPA for the year 2022. The status at the different designated locations is also available on the EPA website (www.beaches.ie).

Note the widespread occurrences of Ectocarpus at ASW 11, 12, 13 (the 3 Dollymount sampling locations). Note also the widespread occurrences of Ectocarpus at Shellybanks (405-42) and the occasional occurrences at ASW 17 (Sandymount Strand) and ASW 18 (Merrion Strand).

Designated bathing water at Dollymount (Bathing Zone) will be allocated **GOOD status in 2022** (predictive)
Designated bathing waters at Sandymount will be allocated **SUFFICIENT status in 2022** (predictive).

Site Location	ASW 12	ASW 17
No. of samples	19	19
2022 Annual Status (predicted)	Good	Sufficient

The remaining 6 locations monitored are not designated bathing waters.

Monitoring data for non-designated bathing waters between 13/06/22 and 13/09/22 is included at the end of this document.

2022 - Non-Designated Bathing Waters: Single Sample Status Assessment Criteria

Parameter	Excellent	Good	Sufficient	Poor
IE (Intestinal Enterococci) cfu/100ml	≤100	101-200	201-250	>250
EC (E.coli) cfu (mpn)/100ml	≤250	251-500	501-1000	>1000

Appendix 7.1.2 Transitional Water Body Monitoring 2022 ASW2 - ASW10

Report for Samples Taken During the Period: 01/01/2022 - 31/12/2022 **at 09/01/2023**

Customer	EPA Code	Test List	Sampling Point	Sampling Point Description	Sampled Date	Sample Number	Ammonia µg/l as N	B.O.D. Saline mg/l	Chlorophyll a mg/m3	DIN ug/l N	Dissolved Oxygen LOW % Sat.	Dissolved Oxygen HIGH % Sat.	Pheophytin a mg/m3	Phosphorus (React) µg/l SRP as P	Phosphorus (React) µg/l SRP as P	Salinity PSU	Silica µg/l as SiO2	Temperature °C	TON µg/l as N
				Surface Water Objectives for Transitional Water Bodies SI 272 of 2009 as amended by SI 77 of 2019				HIGH <3.0 mg/l (95%-ile) GOOD < 4 mg/l (95%-ile)	HIGH-GOOD 2.5 median GOOD-MODERATE 5.0 median		HIGH 0 - 17 % PSU 95%-ile > 80% Sat GOOD 0 -17% PSU 95%-ile > 70% Sat	HIGH 0 - 17 % PSU 95%-ile < 120% Sat. GOOD 0 - 17% PSU 95%-ile < 130% Sat.		HIGH 0% - 17% PSU < 0.030 mg/l P (median) GOOD 0 -17% PSU < 0.060 mg/l P (median)	HIGH >17 - 35% PSU < 0.030 -0.025 mg/l P (median) GOOD > 17 - 35% PSU < 0.060 - 0.040 mg/l P (median)			< 1.5 degrees above ambient outside the mixing zone	
				Compliant															
				Non-Compliant															
DCC	ASW 2S	123_ESTUAR	130842	(130842) Liffey Estuary Lower, 25m North of Poolbeg Wall - Surface Sample	28/04/2022 11:00	1958109	5345	6	8.5	6652	99		1.5	412		33.88	1680	15.1	1307
					26/05/2022 09:31	1967641	730	1	1.2	910	98		0.3	71		33.19	356	14	180
					23/06/2022 09:34	1977335	2377	4	1.6	3432	101		1.3	360		34.38	1721	19.5	1055
					13/07/2022 11:08	1984781	317	1	2.8	575	100		1.8	165		34.02	593	18.7	258
					25/08/2022 08:40	1999459	<10	2	4	< 50	100		1.6	139		33.29	1507	18.2	<40
					21/09/2022 10:16	2008860	1520	2	2.3	2055	99		0.9	377		33.27	1160	15.3	535
									2.6						262.5	33.59			
DCC	ASW 2D	123_ESTUAR	130843	(130843) Liffey Estuary Lower, 25m North of Poolbeg Wall - Depth Sample	28/04/2022 11:00	1958110	191	3	4.7	191	95		1.6	42		34.79	<50	12.6	<40
					26/05/2022 09:29	1967642	177	<1	1.2	177	94		0.4	43		34.68	129	12.9	<40
					23/06/2022 09:36	1977336	153	<1	3.7	153	98		1.2	63		34.77	153	15.1	<40
					13/07/2022 11:10	1984782	86	1	3.3	158	96		1.7	48		34.81	313	16.7	72
					25/08/2022 08:41	1999460	<10	2	5.3	< 50	96		4.1	37		33.61	255	17.3	<40
					21/09/2022 10:20	2008861	343	2	1.9	496	96		0.8	90		33.56	358	14.8	153
									3.5						45.5	34.73			
DCC	ASW 3S	123_ESTUAR	130844	(130844) Liffey Estuary Lower, 50m North of Poolbeg Wall - Surface Sample	28/04/2022 11:00	1958111	5157	6	10.7	5771	99		2.4	357		34.1	1165	14.2	614
					26/05/2022 09:20	1967643	1276	1	0.9	1629	98		0.6	98		33.62	548	14.1	353
					23/06/2022 09:22	1977337	2161	3	2.5	3106	101		1.6	320		34.45	1377	17.1	945
					13/07/2022 10:55	1984783	176	1	3.9	374	99		1.5	121		33.72	443	17.8	198
					25/08/2022 08:48	1999461	<10	1	2.8	112	99		0.7	10		33.36	1737	18.2	112
					21/09/2022 10:27	2008862	856	2	2.3	1318	99		0.9	220		33.41	885	15.5	462
									2.7						170.5	33.67			
DCC	ASW 3D	123_ESTUAR	130845	(130845) Liffey Estuary Lower, 50m North of Poolbeg Wall - Depth Sample	28/04/2022 11:00	1958112	134	2	8.1	134	94		1.3	38		34.95	<50	11.9	<40
					26/05/2022 09:18	1967644	211	<1	1.2	261	92		<0.1	46		34.57	162	13.1	50
					23/06/2022 09:23	1977338	111	1	3.7	111	93		1.1	52		34.82	147	15.4	<40
					13/07/2022 10:57	1984784	162	2	2.5	162	92		0.9	58		34.71	156	16.4	<40
					25/08/2022 08:49	1999462	<10	1	3.6	44	92		1.1	<10		34.26	980	16.9	44
					21/09/2022 10:33	2008863	181	<1	2.7	257	95		0.9	58		34.07	240	14.7	76
									3.2						49	34.64			
DCC	ASW 4S	123_ESTUAR	130846	(130846) Liffey Estuary Lower, 75m North of Poolbeg Wall - Surface Sample	28/04/2022 11:00	1958113	631	3	9.2	835	99		1.2	106		34.11	147	12.9	205
					26/05/2022 09:14	1967645	126	<1	0.9	126	99		0.4	41		34.22	154	12.9	<40
					23/06/2022 09:10	1977339	75	<1	3.3	201	100		1	41		34.37	395	15.6	126
					13/07/2022 10:22	1984785	60	<1	3.2	60	99		1.1	42		33.65	142	17.3	<40
					25/08/2022 09:11	1999463	431	1	4	594	98		1.2	103		33.41	477	18.5	163
					21/09/2022 10:42	2008864	1953	1	1.6	2545	99		0.7	257		33.56	2041	15.5	592
									3.3						72.5	33.88			

					21/09/2022 10:55	2008867	154	<1	2.9	238	96		0.7	53		33.87	246	15.5	84
									3						39	34.73			
DCC	ASW 6S	123_ESTUAR	40063	(40063) Liffey City D/S Islandbdg Weir	28/04/2022 08:45	1957890	27	<1	4.4	3081	90		3	<10		0.3	264	11.5	3054
					26/05/2022 09:10	1967557	96	<1	1.6	1651	90		1.3	16		0.3	1559	15.6	1555
					23/06/2022 08:50	1977249	52	<1	2.8	960	91		2.2	22		0.3	1963	17.6	908
					13/07/2022 09:45	1984722	18	1	7.1	1581	108		2.9	13		0.37	1992	19.6	1563
					25/08/2022 09:40	1999309	<10	2	4.8	1721	90		2.6	23		0.3	3700	17.2	1721
					21/09/2022 08:50	2008771	44	1	1.9	2761	90		2.7	46		0.3	4878	15.2	2717
									3.1					19		0.3			
DCC	ASW 7S	123_ESTUAR	40067	(40067) Liffey City Heuston Stn u/s Camac	28/04/2022 09:10	1957891	19	<1	3.3	2700	83		3.4	<10		1	400	11.2	2681
					26/05/2022 09:25	1967558	55	<1	0.9	1442	82		1.5	24		2.4	1782	15.2	1387
					23/06/2022 09:10	1977250	66	1	1.5	1426	78		16.6	33		1.9	2144	17.1	1360
					13/07/2022 10:00	1984723	13	1	3.6	689	94		2.1	14		7.36	1537	18.3	676
					25/08/2022 09:50	1999310	<10	<1	13.9	1064	88		2.9	<10		3.3	3780	17.1	1064
					21/09/2022 09:10	2008772	59	<1	4	1879	84		4.4	53		2.9	5017	14.6	1820
									3.5					19		2.65			
DCC	ASW 8S	123_ESTUAR	40072	(40072) Liffey City Winetav St Bridge	28/04/2022 11:00	1957892	15	4	31.8	1893	99		13.1	<10		3	287	11.7	1878
					26/05/2022 11:05	1967559	72	<1	1.5	1136	78		1.5	33		9	1421	15.7	1064
					23/06/2022 11:15	1977251	80	2	8.8	1417	86		4.1	42		9.3	1639	18.3	1337
					13/07/2022 10:30	1984724	58	<1	2.1	166	90		2.1	26		27.4	318	17.6	108
					25/08/2022 10:00	1999311	<10	2	3.1	42	83		2.6	<10		17	978	17.2	42
					21/09/2022 11:00	2008773	76	<1	2.3	1953	84		1.9	56		5.2	4565	15.2	1877
									2.7					29.5		9.2			
DCC	ASW 9S	123_ESTUAR	40457	(40457) Liffey (S) D/S Toll Bridge	28/04/2022 09:40	1957893	40	2	21	951	99		5.1	18		15.6	262	10.9	911
					26/05/2022 09:50	1967560	87	<1	1.3	998	84		1.4	35		18.8	2080	14.5	911
					23/06/2022 09:35	1977252	72	1	5.9	593	82		3.6	42		12.1	3451	16.2	521
					13/07/2022 10:40	1984725	64	<1	2.7	211	94		1.9	29		28.7	334	18.8	147
					25/08/2022 10:20	1999312	<10	1	2.3	88	88		1.5	<10		23.7	537	17.1	88
					21/09/2022 09:40	2008774	100	<1	0.9	1226	86		1.3	54		13.5	4197	14.7	1126
									2.5						32	17.2			
DCC	ASW 10S	123_ESTUAR	45082	(45082) Tolka River D/S Annesley Bridge	28/04/2022 10:00	1957894	391	2	18.7	1306	76		7	99		14.8	739	10.8	915
					26/05/2022 10:10	1967561	116	<1	2.7	1667	82		2.5	83		4.5	5620	14.5	1551
					23/06/2022 09:45	1977253	177	1	3.5	1315	68		2.3	151		6.8	5223	16.6	1138
					13/07/2022 11:30	1984726	82	1	3	565	97		3	62		10.35	1790	18.8	483
					25/08/2022 10:35	1999313	<10		12.1	< 50	81		4.2	30		20.4	1810	16.7	<40
					21/09/2022 09:55	2008775	232	2	12.7	867	73		5.4	134		20.2	1541	15.7	635
									7.8					91		12.58			

Appendix 7.1.3 Transitional Water Body Monitoring 2022 - EPA DB-020 to DB-420

Report for Samples Taken During the Period: 01/01/2022 - 31/12/2022 **at 09/01/2023**

Custom	EPA Code	Test List	Sampling Point	Sampling Point Description	Sampled Date	Sample Number	Ammonia µg/l as N	B.O.D. Saline mg/l	Bottom Oxygen % Sat.	Bottom Temp °C	Chlorophyll a mg/m3	DIN µg/l N	Dissolved Oxygen % Sat.	Dissolved Oxygen % Sat.	Oxygen at 0 m depth % Sat.	Pheophytin a mg/m3	Phosphorus (React) µg/l SRP as P	Phosphorus (React) µg/l SRP as P	Salinity PSU	Salinity (mean) PSU	Silica µg/l as SiO2	Surface Temp °C	Temp °C	TON µg/l as N
				Surface Water Objectives for Transitional Water Bodies SI 272 of 2009 as amended by SI 77 of 2019																			
				Compliant				HIGH <3.0 mg/l (95%-ile) GOOD < 4 mg/l (95%-ile)			HIGH-GOOD 2.5 median GOOD-MODERATE 5.0 median		HIGH 0 - 17 % PSU 95%-ile > 80% Sat GOOD 0 -17% PSU 95%-ile > 70% Sat	HIGH 0 - 17 % PSU 95%-ile < 120% Sat. GOOD 0 - 17% PSU 95%-ile < 130% Sat.			HIGH 0% - 17% PSU < 0.030 mg/l P (median) GOOD 0 -17% PSU < 0.060 mg/l P (median)	HIGH >17 - 35% PSU < 0.030 -0.025 mg/l P (median) GOOD > 17 - 35% PSU < 0.060 - 0.040 mg/l P (median)					
				Non-Compliant																				
DCC	DB 020	123_ESTUAR	130870	(130870) Liffey Estuary Upper, Liffey at Matt Talbot Bridge - Surface Sample	28/04/2022 11:00	1958117	41	2			0.9	2359	98			1.3	14		14.62		299		12.5	2318
					26/05/2022 07:30	1967649	164	1			4.4	494	98			1.3	62		21.47		570		13.2	330
					23/06/2022 07:31	1977343	193	1			7.5	1159	101			3	68		20.61		2301		15.8	966
					13/07/2022 08:21	1984789	98	1			4.4	411	97			2.4	43		20.61		623		17.3	313
					25/08/2022 08:05	1999467	38	2			4.9	373	100			2.2	14		29.02		840		17.7	335
					21/09/2022 08:02	2008868	97	1			0.4	1602	93			0.6	59		31.62		2998		15.3	1505
											4.4							51	**21.04**					
DCC	DB 020	123_ESTUAR	130871	(130871) Liffey Estuary Upper, Liffey at Matt Talbot Bridge - Depth Sample	28/04/2022 11:00	1958118	346	2			12.3	551	93			4.7	127		33.71		314		12.1	205
					26/05/2022 07:28	1967650	236	<1			3.6	283	94			1.2	80		34.05		370		13.1	47
					23/06/2022 07:32	1977344	162	2			7.2	205	95			8.1	57		33.27		555		15.5	43
					13/07/2022 08:22	1984790	155	1			3.7	234	92			3.6	54		33.07		512		15.9	79
					25/08/2022 08:06	1999468	72	1			7.3	122	97			3.9	27		33.52		217		17.2	50
					21/09/2022 08:06	2008869	127	1			3.1	281	92			2.5	55		32.24		343		15	154
											5.5							56	**33.4**					
DCC	DB120	123_ESTUAR	130800	(130800) Liffey Estuary Lower, Dodder Grand Canal Basin- Surface Sample	28/04/2022 11:00	1958100	67	2			3.2	1053	100			3.1	19		15.61		632		12.9	986
					26/05/2022 07:45	1967632	123	<1			2.7	303	100			0.7	512		21.47		418		13.1	180
					23/06/2022 07:41	1977326	71	1			5.7	338	100			3.3	34		22.21		1137		15.8	267
					13/07/2022 08:29	1984772	45	2			3.2	191	99			3	23		23.67		784		17.2	146
					25/08/2022 08:12	1999450	<10	1			11.2	109	95			3.3	10		21.38		1421		17.2	109
					21/09/2022 08:30	2008851	106	1			3.7	1149	98			2.1	56		21.41		4160		15.2	1043
											3.45							28.5	**21.44**					
DCC	DB 120	123_ESTUAR	130801	(130801) Liffey Estuary Lower, Dodder Grand Canal Basin- Depth Sample	28/04/2022 11:00	1958101	282	3			28.8	546	97			11.2	64		33.42		162		12.5	264
					26/05/2022 07:43	1967633	142	1			4.5	201	97			0.8	430		34.05		261		13.2	59
					23/06/2022 07:42	1977327	163	1			0.3	210	94			9.5	54		33.54		354		15.2	47
					13/07/2022 08:31	1984773	58	<1			2.9	188	96			1.3	30		33.36		636		16.8	130
					25/08/2022 08:13	1999451	<10	2				< 50	94				<10		32.97		806		16.5	<40
					21/09/2022 08:35	2008852	136	<1			0.9	384	95			1.2	51		33.01		662		14.6	248
											2.9							53	**33.39**					
DCC	DB 210	123_ESTUAR	130810	(130810) Liffey Estuary Lower, East Link Toll Bridge - Surface Sample	28/04/2022 11:00	1958102	63	2			3.1	1629	100			1.4	18		21.6		332		12.8	1566
					26/05/2022 07:58	1967634	139	<1			2.7	300	100			0.8	301		28.48		385		13.3	161
					23/06/2022 07:50	1977328	78	1			3.9	403	101			2.2	28		29.36		758		15.9	325
					13/07/2022 08:42	1984774	81	<1			2.9	321	100			1.6	27		28.15		559		17.1	240
					25/08/2022 08:20	1999452	<10	<1			3.1	290	99			1.6	<10		28.71		1365		17.4	290
					21/09/2022 08:42	2008853	99	<1			0.9	1468	93			0.5	58		29.62		4506		15.3	1369
											3							28	**28.6**					
DCC	DB 210	123_ESTUAR	130811	(130811) Liffey Estuary Lower, East Link Toll Bridge - Depth Sample	28/04/2022 11:00	1958103	251	2			14.2	358	97			4.4	73		34.51		86		12.4	107
					26/05/2022 07:56	1967635	142	<1			3.1	192	97			1.7	195		33.84		209		13.2	50
					23/06/2022 07:51	1977329	127	1			4.7	180	93			1.4	52		33.77		281		15.4	53
					13/07/2022 08:44	1984775	48	<1			3.3	169	94			2.2	39		33.88		573		16.6	121
					25/08/2022 08:21	1999453	<10	1			4.3	139	95			2.3	<10		33.82		1275		16.7	139
					21/09/2022 08:48	2008854	138	1			3.3	328	92			1.5	51		34.12		481		14.7	190
											3.8							52	**33.86**					
DCC	DB 220	123_ESTUAR	130820	(130820) Liffey Estuary Lower, RO RO Ramp No. 5 (Old TW Outfall) - Surface Sample	28/04/2022 11:00	1958104	207	2			12.8	583	100			1.1	52		29.96		103		12.8	376
					26/05/2022 08:21	1967636	115	<1			1.1	214	100			0.4	121		32.37		281		13.1	99
					23/06/2022 08:10	1977330	77	1			3.2	77	101			1	42		33.61		178		15.4	<40

					13/07/2022 09:05	1984776	35	<1			2.8	118	100			2.3	28		33.36		372		17	83
					25/08/2022 08:31	1999454	<10	<1			3.2	241	99			1.4	<10		33.66		1268		17.7	241
					21/09/2022 09:01	2008855	109	<1			2.8	467	101			0.7	50		34.11		790		15.9	358
											3							46	33.49					
DCC	DB 220	123_ESTUAR	130821	(130821) Liffey Estuary Lower, RO RO Ramp No. 5 (Old TW Outfall) - Depth Sample	28/04/2022 11:00	1958105	112	2			12.4	180	99			1.8	37		34.62		<50		12.6	68
					26/05/2022 08:19	1967637	112	<1			1.3	156	97			0.3	32		34.18		168		13.1	44
					23/06/2022 08:11	1977331	65	<1			3.5	65	97			1.1	36		34.59		107		15.2	<40
					13/07/2022 09:07	1984777	17	<1			2.5	17	96			1.1	26		34.19		311		15.8	<40
					25/08/2022 08:32	1999455	<10	<1			2.9	64	93			2	10		34.29		1118		17.1	64
					21/09/2022 09:05	2008856	121	<1			3.2	262	99			0.9	44		34.68		382		15.4	141
											3.1							34	34.44					
DCC	DB 410	123_ESTUAR	130830	(130830) Liffey Estuary Lower, Ringsend Cascade - Surface Sample	28/04/2022 11:00	1958106	1141	4			7.9	1302	100			1	121		33.58		218		12.9	161
					26/05/2022 09:41	1967638	170	<1			0.8	170	99			0.3	31		33.45		142		12.9	<40
					23/06/2022 09:06	1977332	95	1			3.5	230	102			1.2	40		34.27		437		15.6	135
					13/07/2022 10:30	1984778	47	<1			2.4	124	101			1	35		33.92		288		17.5	77
					25/08/2022 09:18	1999456	<10	1			2.7	76	98			1.1	10		33.49		1104		18.7	76
					21/09/2022 10:00	2008857	1194	2			1.6	2055	99			1.8	527		33.17		1387		15.6	861
											2.6							38	33.47					
DCC	DB 410	123_ESTUAR	130831	(130831) Liffey Estuary Lower, Ringsend Cascade - Depth Sample	28/04/2022 11:00	1958107	177	2			5.9	220	97			1.9	35		34.81		<50		11.6	43
					26/05/2022 09:39	1967639	132	<1			1.1	132	95			0.3	34		34.71		131		12.8	<40
					23/06/2022 09:08	1977333	46	<1			2.9	46	93			0.8	31		34.71		87		14.9	<40
					13/07/2022 10:32	1984779	18	<1			1.6	18	93			0.5	44		34.79		115		15.1	<40
					25/08/2022 09:19	1999457	<10	1			3.7	< 50	93			1.4	<10		34.16		882		17.2	<40
					21/09/2022 10:05	2008858	183	<1			3.5	279	98			0.6	61		34.26		268		15	96
											3.2							35	34.71					
DCC	DB 420	123A_ESTUA	130839	(130839) Liffey Estuary Lower, Poolbeg Lighthouse - Composite Sample	28/04/2022 11:00	1958108	91	2	100.4	12.6	5.2	91			100.9	0.6	29			35.3	<50	12.8		<40
					26/05/2022 10:02	1967640	32	<1	100.6	12.9	0.9	32			101	0.4	18			35.02	75	13.1		<40
					23/06/2022 09:55	1977334	214	1	101.3	15.5	2.7	264			101.7	1.2	78			35.16	232	15.9		50
					13/07/2022 11:31	1984780	87	<1	101.3	16.7	2	138			101.6	0.6	51			35.29	152	17		51
					25/08/2022 10:11	1999458	<10	<1	101.2	16.7	2.8	50			101.6	0.7	<10			35.08	1196	17		50
					21/09/2022 11:15	2008859	161	<1	101.7	15.6	2.7	238			102	0.9	52			34.95	252	15.8		77
											2.7							40		35.12				
DCC	DB 300	123_ESTUAR	45076	(45076) Tolka River U/S Drumcondra Bridge	28/04/2022 10:35	1957895	33	<1			8.3	1348	101			4.5	29		0.4		1371		10.4	1315
					26/05/2022 10:40	1967562	79	1			4.3	1596	95			2.3	75		0.4		6982		16.1	1517
					23/06/2022 10:30	1977254	75	1			3.7	1673	100			3.1	140		0.4		6249		17.1	1598
					13/07/2022 11:20	1984727	55	1			17.8	1047	98			8.9	48		0.35				19.2	992
					25/08/2022 11:15	1999314	<10	<1			25.9	600	96			7.8	11		0.4		6173		16.8	600
					21/09/2022 10:35	2008776	26	1			3.2	1787	107			2.1	88		0.4		5034		14.8	1761
											6.3						61.2		0.4					
DCC	DB 320	123_ESTUAR	130900	(130900) Tolka Estuary at East Point Business Park Bridge - Surface Sample	28/04/2022 10:20	1957896	378	1			7.7	1536	80			<0.1	87		9.5		982		10.9	1158
					26/05/2022 10:30	1967563	111	<1			1.5	1079	83			2.1	73		10.1		4338		15.2	968
					23/06/2022 10:05	1977255	203	<1			<0.1	1162	73			5.9	150		8.9		4869		17.2	959
					13/07/2022 12:20	1984728	65	<1			2.7	556	98			2.9	51		13.34		1992		18.4	491
					25/08/2022 10:55	1999315	<10	2			9.6	< 50	92			3	21		24.5		2654		17	<40
					21/09/2022 10:25	2008777	211	1			13.1	646	84			3.9	131		22.4		933		16	435
											5.2						80		11.72					
DCC	DB 320	123_ESTUAR	130901	(130901) Tolka Estuary at East Point Business Park Bridge - Depth Sample	28/04/2022 10:10	1957897	311	4				1169	85				87		14.7		873		11.1	858
					26/05/2022 10:20	1967564	123	<1			1.5	769	80			1.5	59		20.2		2494		14.6	646
					23/06/2022 09:55	1977256	509	1			2.9	1165	88			2.6	325		15.4		3517		17	656
					13/07/2022 12:30	1984729	86	2			3.7	358	100			2.7	51		21.08		1346		19.2	272
					25/08/2022 10:45	1999316	<10	5			2.9	< 50	104			2.2	<10		30.3		631		17.2	<40
					21/09/2022 10:10	2008778	337	2			15.5	592	76			4.5	164		27.7		561		16.1	255
											3.7							73	20.64					

DCC	DB 330	123_ESTUAR	130910 (130910) Tolka Estuary, Castle Ave. - Surface Sample	26/05/2022 08:45	1967651	172	<1			1.1	330	100			1.1	75		33.61		657		13.4	158
										1.1						75		33.61							
DCC	DB330	123_ESTUAR	130911 (130911) Tolka Estuary, Castle Ave. - Depth Sample	26/05/2022 08:43	1967652	176	<1			1.2	279	99			0.9	63		34.51		373		13.1	103
										1.2						63		34.51							
DCC	DB 330	123A_ESTUA	130912 (130912) Tolka Estuary, Castle Ave. - Composite Sample	28/04/2022 11:00	1958119	381	2	99.6	12.6	14.4	578			99.9	3.5	106			35.02	87	12.7		197
				23/06/2022 08:31	1977345	357	1	99.8	16.3	4	472			99.9	1.8	136			34.87	583	16.4		115
				13/07/2022 09:49	1984791	65	1	99	16.7	4.5	121			99.1	1.9	50			34.92	194	16.8		56
				25/08/2022 09:45	1999469	61	2	100.7	17.4	10.9	131			100.6	3.1	31			33.89	401	17.4		70
				21/09/2022 09:41	2008870	348	<1	97.2	15.7	4.7	551			97.3	0.7	123			34.25	414	15.8		203
										4.7						106		34.87							
DCC	DB 340	123A_ESTUA	130922 (130922) Tolka Estuary, Clontarf Boat Club - Composite Sample	28/04/2022 11:00	1958120	169	2	99.8	12.6	15.6	249			99.9	2.7	58			35.06	<50	12.6		80
				26/05/2022 08:38	1967653	124	<1	100	13.1	0.8	124			100.1	0.5	40			34.87	150	13.2		<40
				23/06/2022 08:22	1977346	338	<1	99.2	16.3	3.6	419			99.2	1.4	121			34.92	328	16.3		81
				13/07/2022 09:33	1984792	43	1	99.5	16.6	2.9	43			99.6	1.2	36			34.86	156	16.7		<40
				25/08/2022 09:35	1999470	49	<1	99.8	17.4	4.5	112			99.9	1.6	38			34.42	377	17.5		63
				21/09/2022 09:33	2008871	392	1	97.4	15.6	3.6	620			97.5	1	147			34.39	442	15.6		228
										3.6						49		34.87							
DCC	DB 350	123A_ESTUA	130932 (130932) Tolka Estuary, S. Lagoon at Bull Wall Wooden Bridge - Composite Sample	28/04/2022 11:00	1958121	247	2	99.4	12.6	16.7	363			99.7	2.8	67			34.89	<50	12.7		116
				26/05/2022 08:53	1967654	204	<1	99.8	13.4	1.3	248			99.9	1.1	47			34.95	173	13.4		44
				23/06/2022 08:42	1977347	194	1	98.6	16.5	4.9	236			98.7	1.6	85			35.02	215	16.7		42
				13/07/2022 09:59	1984793	57	<1	99.5	16.6	3.3	101			99.6	1.9	56			35.07	161	16.6		44
				25/08/2022 09:56	1999471	67	1	100.2	17.5	7.6	127			100.3	1.9	21			34.1	421	17.6		60
				21/09/2022 09:22	2008872	489	1	98.1	15.6	5.7	776			98.2	2.8	172			34.28	595	15.7		287
										5.3						61.5		34.92							

Appendix 7.1(4) Dublin Bay Water Quality Monitoring Points Agreed by EPA

Report for Samples Taken During the Period: 01/01/2022 - 31/12/2022 — **at 09/01/2023**

Customer	EPA Code	Test List	Sampling Point	Sampling Point Description	Sampled Date	Sample Number	Ammonia	B.O.D. Saline	Bottom Oxygen	Bottom Temp	Chlorophyll a	DIN	DIN	Dissolved Oxygen	Dissolved Oxygen	Oxygen at 0 m depth	Pheophytin a	Phosphorus (React)	Salinity	Salinity (mean)	Silica	Surface Temp	Temp	TON
							µg/l as N	mg/l	% Sat.	°C	mg/m3	ug/l N (Winter and Summer)	ug/l N (Winter and Summer)	% Sat. Lower Limit	% Sat. Upper Limit	% Sat.	mg/m3	µg/l SRP as P	PSU	PSU	µg/l as SiO2	°C	°C	µg/l as N
				Surface Water Objectives for Transitional Water Bodies SI 272 of 2009 as amended by SI 77 of 2019				HIGH			HIGH-GOOD	HIGH STATUS	HIGH STATUS	HIGH	HIGH							< 1.5 degrees above ambient outside the mixing zone	< 1.5 degrees above ambient outside the mixing zone	
				Compliant				<3.0 mg/l (95%-ile)			2.5 median	0% PSU <1000 ug/l N	34.5% PSU 170 ug/l	>17% to 35% PSU 95%-ile > 80-85%	>17% to 35% PSU 95%-ile < 115 -120% Sat.								
								GOOD < 4 mg/l (95%-ile)			GOOD-MODERATE 5.0 median	GOOD STATUS 0% PSU 2,600 ug/l N	GOOD STATUS 34.5% PSU 250 ug/l	GOOD >17% to 35% PSU 95%-ile > 70--80 %	GOOD >17% to 35% PSU 95%-ile <120 - 130% Sat								
				Non-Compliant																				
DCC	DB 610	123A_ESTUA	130602	(130602) Irish Sea Dublin, Bailey - Composite Sample	25/05/2022 09:55	1967194	49	1	101.3	12	2.4	49				101.9	0.5	30		35.66	73	12.4		<40
					22/06/2022 09:37	1976896	57	<1	97.4	13.4	3.1	57				98.3	1	34		35.48	96	13.8		<40
					20/07/2022 08:38	1987198	13	1	101.2	14.4	2.5	13				101.8	0.5	13		35.48	<50	14.8		<40
					24/08/2022 08:28	1998825	<10	1	102.1	17	4.5	< 50				102.4	0.9	11		35.61	325	17.3		<40
											2.8									**35.55**				
DCC	DB 430	123_ESTUAR	130700	(130700) Dublin Bay,1km NE Poolbeg Lighthouse - Surface Sample	25/05/2022 09:08	1967185	86	<1			1.3	86		101			0.3	30	35.21		80		12.2	<40
DCC	DB 430	123_ESTUAR	130701	(130701) Dublin Bay,1km NE Poolbeg Lighthouse - Depth Sample	25/05/2022 09:10	1967186	40	<1			2.5	40		100			<0.1	28	35.5		82		12	<40
DCC	DB 430	123A_ESTUA	130702	(130702) Dublin Bay,1km NE Poolbeg Lighthouse - Composite Sample	22/06/2022 09:05	1976888	56	<1	102.2	14.4	3.9	56				102	0.8	28		35.32	85	14.5		<40
					20/07/2022 09:09	1987190	60	1	102.2	15	2.4	60				102.8	1.2	33		35.43	93	15.3		<40
					24/08/2022 09:02	1998817	<10	<1	101.1	16.7	3.3	219				101.4	0.9	<10		35.26	1740	16.9		219
											3.3									**35.32**				
DCC	DB 450	123A_ESTUA	130712	(130712) Dublin Bay, South Bull Bouy, 1km SE Poolbeg Lighthouse - Composite Sample	25/05/2022 08:47	1967187	82	<1	100.6	11.9	1.1	82				101.1	0.5	36		35.4	88	12.3		<40
					22/06/2022 09:13	1976889	204	<1	100.2	14.2	2.5	248				100.6	1.1	77		35.38	174	14.6		44
					20/07/2022 09:15	1987191	34	<1	101.2	14.8	2.1	34				101.6	0.9	28		35.36	87	15.1		<40
					24/08/2022 09:20	1998818	<10	<1	101	16.3	2.9	< 50				101.5	0.5	<10		35.32	343	16.8		<40
											2.3									**35.37**				
DCC	DB 510*	123A_ESTUA	130722	(130722) Dublin Bay, 2.5km ENE Poolbeg Lighthouse - Composite Sample	25/05/2022 09:22	1967189	65	1	100.6	12.1	1.1	65				101	0.4	28		35.5	88	12.4		<40
					22/06/2022 08:55	1976891	49	<1	102.6	14.2	3.2	49				103.4	0.6	36		35.4	92	14.5		<40
					20/07/2022 08:58	1987193	13	<1	103.6	14.7	2.5	13				104.1	0.5	17		35.44	<50	15.1		<40
					24/08/2022 08:51	1998820	<10	<1	101.3	16.7	2.5	< 50				101.7	1.2	12		35.48	359	17		<40
											2.5									**35.46**				
DCC	DB 540*	123A_ESTUA	130732	(130732) Dublin Bay, 2.5km SSE Poolbeg Lighthouse - Composite Sample	25/05/2022 08:34	1967190	47	<1	100.8	12.1	1.3	47				101.2	0.4	32		35.52	95	12.4		<40
					22/06/2022 09:22	1976892	39	<1	99.7	13.8	3.5	39				100.6	0.9	34		35.41	107	14.4		<40
					20/07/2022 09:28	1987194	26	<1	101.2	14.6	2.3	26				101.7	0.8	21		35.39	59	15		<40
					24/08/2022 09:28	1998821	<10	<1	100.8	16.3	2.9	< 50				101.4	0.8	11		35.49	335	16.8		<40
											2.6									**35.45**				
DCC	DB 550	123A_ESTUA	130742	(130742) Dublin Bay, No. 4 Bouy, 2.5km E of S Poolbeg Lighthouse - Composite Sample	25/05/2022 08:22	1967188	37	<1	100.3	12.1	0.8	37				100.7	0.2	30		35.47	93	12.4		<40
					22/06/2022 09:51	1976890	28	<1	98.3	14.5	3.5	28				98.9	0.6	31		35.39	94	14.7		<40
					20/07/2022 09:48	1987192	12	<1	100.3	14.7	1.3	12				100.9	0.5	23		35.35	55	15		<40
					24/08/2022 09:58	1998819	<10	<1	101.1	16	1.9	< 50				101.7	0.6	17		35.42	372	16.6		<40
											1.6									**35.41**				
DCC	DB 560	123A_ESTUA	130752	(130752) Dublin Bay, Drumleck Point, 5km ENE Poolbeg Lighthouse - Composite Sample	25/05/2022 09:41	1967192	63	1	101.3	12.2	1.5	63				101.6	0.6	31		35.54	93	12.4		<40
					22/06/2022 08:46	1976894	43	<1	98.4	13.3	3.2	43				98.9	0.9	34		35.44	99	13.8		<40
					20/07/2022 08:47	1987196	20	1	101.2	14.6	2.4	20				101.6	0.6	18		35.41	54	14.7		<40
					24/08/2022 08:40	1998823	<10	1	101.1	17.2	4.1	< 50				101.6	1.1	15		35.52	338	17.5		<40
											2.8									**35.48**				

DCC	DB 570*	123A_ESTUA	130762 (130762) Dublin Bay, 5km ESE Poolbeg Lighthouse - Composite Sample	25/05/2022 10:29	1967193	46	<1	101.2	12.2	2.1	46				101.6	0.6	34		35.58	88	12.5		<40
				22/06/2022 09:39	1976895	48	<1	97.5	13.3	3.3	48				98.5	1	35		35.46	104	14		<40
				20/07/2022 09:38	1987197	12	<1	101	14.3	2.4	12				101.6	0.7	30		35.46	73	14.7		<40
				24/08/2022 09:39	1998824	<10	<1	101.5	16.2	1.9	< 50				102	0.7	17		35.44	327	16.6		<40
										2.3									**35.46**				
DCC	DB 580	123A_ESTUA	130772 (130772) Dublin Bay, Dún Laoghaire, 5km E of S Poolbeg Lighthouse - Composite Sample	25/05/2022 08:11	1967191	46	<1	100.9	12.1	0.8	46				101.5	0.1	26		35.52	87	12.5		<40
				22/06/2022 08:18	1976893	33	<1	98.4	13.6	2.7	33				99.5	0.5	31		35.37	92	14.2		<40
				20/07/2022 08:19	1987195	11	<1	101.1	14.6	1.7	11				101.9	0.6	18		35.39	51	15.1		<40
				24/08/2022 07:00	1998822	<10	<1	100.3	16.2	2.7	< 50				100.8	0.7	11		35.38	334	16.6		<40
										2.2									**35.39**				

Appendix 7.1(5) Bathing Water Monitoring

Report for Samples Taken During the Period: 01/05/2022 - 30/09/2022

Compliant with SUFFICIENT QUALITY
Non-Compliant with SUFFICIENT QUALITY
POOLBEG DISCHARGE PLUME

Customer	EPA Code	Test List	Sampling Point	Sampling Point Description	Sampled Date	Sample Number	E. coli MPN/100ml	Enterococci CFU/100ml	Enterococci (Confirmed) CFU/100ml	Floating Materials	Mineral Oil (visual)	Number Colonies Confirmed	pH pH	Phenols_Olfactory	Salinity PSU	Surfactants	Total Coliforms CFU/100ml	Visual Comments	Visual Inspection
DCC	ASW 11	121_BEA_DCC	40520	(40520) Dollymount North	25/05/2022 07:00	1966956	<10		12	Absent	Absent		8	Absent	31.2	Absent		No Comment	Normal
					13/06/2022 10:00	1973241	228		3	Absent	Absent		8.4	Absent	33.4	Absent		No Comment	Normal
					14/06/2022 09:20	1973970	52		34	Absent	Absent		8.2	Absent	34.2	Absent		No Comment	Normal
					19/06/2022 15:35	1975636	10		11	Ectocarpus Present	Absent		8.6	Absent	34.3	Absent		No Comment	Ectocarpus present
					27/06/2022 09:15	1978136	10		5	Ectocarpus Present	Absent		8.1	Absent	32.9	Absent		Birds	Ectocarpus present
					28/06/2022 09:40	1978735	63		12	Ectocarpus Present	Absent		8.1	Absent	32.8	Absent		No Comment	Ectocarpus present
					03/07/2022 13:50	1980636	10		8	Ectocarpus Present	Absent		7.6	Absent	34.1	Absent		No Comment	Ectocarpus present
					11/07/2022 11:40	1983578	10		12	Ectocarpus Present	Absent		8.2	Absent	33.7	Absent		Dogs & Birds	Ectocarpus present
					17/07/2022 13:30	1985949	30		11	Ectocarpus Present	Absent		8.2	Absent	34.5	Absent		Birds	Ectocarpus present
					25/07/2022 11:25	1988486	52		10	Ectocarpus Present	Absent		8.2	Absent	33.3	Absent		Birds	Ectocarpue present
					26/07/2022 09:15	1989004	31		9	Ectocarpus Present	Absent		8.2	Absent	34.2	Absent		Birds	Ectocarpus present
					08/08/2022 10:00	1992529	20		7	Ectocarpus Present	Absent		8.1	Absent	33.7	Absent		Birds	Ectocarpus present
					09/08/2022 10:00	1993344	31		14	Absent	Absent		8.3	Absent	33.6	Absent		Dogs	Normal
					14/08/2022 00:00	1994903	10		13	Ectocarpus Present	Absent		8.1	Absent	33.9	Absent		No Comment	Ectocarpus present
					22/08/2022 11:00	1997778	148		22	Ectocarpus Present	Absent		8.2	Absent	33.2	Absent		Dogs & Birds	Ectocarpus present
					23/08/2022 11:40	1998299	203		70	Ectocarpus Present	Absent		8.5	Absent	33.2	Absent		Birds	Ectocarpus present
					29/08/2022 10:20	2000284	41		34	Ectocarpus Present	Absent		8.1	Absent	34	Absent		Birds	Ectocarpus present
					06/09/2022 08:00	2003535	364		39	Ectocarpus Present	Absent		8	Absent	29.8	Absent		Dogs	Ectocarpus Present
					11/09/2022 11:55	2005204	663		800	Absent	Absent		8	Absent	32.2	Absent		Dogs & Birds	Normal
					13/09/2022 12:45	2006127	134		130	Absent	Absent		8.1	Absent	33.7	Absent		Dogs	Normal
					Number	**19**	**19**		**19**										
					26/09/2022 14:50	2010391	20		10	Ectocarpus Present	Absent		8.4	Absent	33	Absent		Birds	Ectocarpus Present
DCC	ASW 12*	121_BEA_DCC	40526	(40526) Dollymount Bathing Zone	25/05/2022 07:15	1966959	243		71	Absent	Absent		7.9	Absent	30.5	Absent		No Comment	Normal
					13/06/2022 10:15	1973242	20		5	Absent	Absent		8.2	Absent	33.7	Absent		No Comment	Normal
					14/06/2022 09:35	1973971	134		62	Absent	Absent		8.2	Absent	34.3	Absent		No Comment	Normal
					19/06/2022 15:50	1975637	<10		11	Ectocarpus Present	Absent		8.6	Absent	34.5	Absent		No Comment	Ectocarpus present
					27/06/2022 09:25	1978137	52		7	Ectocarpus Present	Absent		8.2	Absent	32.8	Absent		Birds	Ectocarpus present
					28/06/2022 09:55	1978736	62		28	Ectocarpus Present	Absent		7.8	Absent	32.9	Absent		No Comment	Ectocarpus present
					03/07/2022 14:10	1980637	30		4	Ectocarpus Present	Absent		8.7	Absent	34	Absent		Dogs	Ectocarpus present
					11/07/2022 11:50	1983579	<10		5	Ectocarpus Present	Absent		8.2	Absent	33.8	Absent		Dogs & Birds	Ectocarpus present
					17/07/2022 13:45	1985950	41		4	Ectocarpus Present	Absent		8.3	Absent	34.1	Absent		Birds	Ectocarpus present
					25/07/2022 11:40	1988487	301		36	Ectocarpus Present	Absent		8.3	Absent	33.3	Absent		Birds	Ectocarpue present
					26/07/2022 09:30	1989005	20		8	Ectocarpus Present	Absent		8.1	Absent	34.3	Absent		Birds	Ectocarpus present
					08/08/2022 10:15	1992534	41		8	Ectocarpus Present	Absent		8.2	Absent	33.6	Absent		Birds	Ectocarpus present
					09/08/2022 10:20	1993345	97	<1		Absent	Absent		8.2	Absent	33.5	Absent		Dogs	Normal
					14/08/2022 12:35	1994904	20		12	Ectocarpus Present	Absent		8.1	Absent	34.1	Absent		No Comment	Ectocarpus present
					22/08/2022 11:10	1997779	120		31	Ectocarpus Present	Absent		8.2	Absent	33.2	Absent		Dogs & Birds	Ectocarpus present
					23/08/2022 11:50	1998300	448		80	Ectocarpus Present	Absent		8.5	Absent	33.3	Absent		Birds	Ectocarpus present
					29/08/2022 10:35	2000285	110		32	Ectocarpus Present	Absent		8.1	Absent	33.4	Absent		Birds	Ectocarpus present
					06/09/2022 08:20	2003536	211		53	Ectocarpus Present	Absent		8	Absent	29.8	Absent		Dogs	Ectocarpus Present
					11/09/2022 12:10	2005205	98		124	Absent	Absent		8	Absent	32.3	Absent		Dogs & Birds	Normal
					13/09/2022 12:55	2006128	135		120	Absent	Absent		8.1	Absent	34.3	Absent		No Comment	Normal
					Number	**19**	**19**	**1**	**18**										

					Number	**19**	**19**	**1**	**18**										
					26/09/2022 15:25	2010394	41		52	Absent	Absent		8.2	Absent	32	Absent		Dogs	Normal
DCC		**121_BEA_DCC**	**40539**	**(40539) Clontarf Yacht Club**	13/06/2022 10:55	1973253	20	<1		Absent	Absent		8	Absent	33	Absent		No Comment	Normal
					14/06/2022 10:10	1973982	63		24	Absent	Absent		8	Absent	32.4	Absent		No Comment	Normal
					19/06/2022 16:35	1975648	10		2	Absent	Absent		8	Absent	32.9	Absent		No Comment	Normal
					27/06/2022 10:10	1978148	272		59	Absent	Absent		8	Absent	30.6	Absent		Dogs	Normal
					28/06/2022 10:50	1978747	74		24	Absent	Absent		7.8	Absent	29.9	Absent		No Comment	Normal
					03/07/2022 15:15	1980648	52		18	Absent	Absent		8	Absent	32.1	Absent		No Comment	Normal
					11/07/2022 11:15	1983590	31		6	Absent	Absent		8	Absent	29.6	Absent		No Comment	Normal
					17/07/2022 14:35	1985961	10		73	Absent	Absent		8	Absent	32.5	Absent		No Comment	Normal
					25/07/2022 11:10	1988498	346		420	Absent	Absent		8	Absent	32	Absent		No Comment	Normal
					26/07/2022 10:15	1989016	52		10	Absent	Absent		8	Absent	32.3	Absent		No Comment	Normal
					08/08/2022 11:00	1992545	41		9	Absent	Absent		8	Absent	31.9	Absent		No Comment	Normal
					09/08/2022 13:30	1993356	10		3	Absent	Absent		8.1	Absent	31.6	Absent		No Comment	Normal
					14/08/2022 00:00	1994915	10		4	Absent	Absent		8.1	Absent	32.1	Absent		No Comment	Normal
					22/08/2022 11:55	1997790	203		66	Absent	Absent		8	Absent	31.4	Absent		Birds	Normal
					23/08/2022 12:35	1998311	144		24	Absent	Absent		8.1	Absent	31.9	Absent		No Comment	Normal
					29/08/2022 11:30	2000296	85		18	Absent	Absent		8	Absent	31.9	Absent		No Comment	Normal
					06/09/2022 09:00	2003547	1722		460	Absent	Absent		7.9	Absent	24	Absent		Dogs	Normal
					11/09/2022 12:55	2005216	134		93	Absent	Absent		8	Absent	30.5	Absent		No Comment	Normal
					13/09/2022 14:05	2006139	218		400	Absent	Absent		8	Absent	31.9	Absent		Dogs	Normal
					Number	**19**	**19**	**1**	**18**										
DCC	**ASW 15**	**121P_BW**	**40538**	**(40538) Poolbeg Outfall Main Discharge**	25/05/2022 07:05	1966962	322		480	Absent	Absent		7.8	Absent	29.8	Absent		No Comment	Normal
					13/06/2022 12:55	1973245	960		630	Absent	Absent		7.6	Absent	27.8	Absent		No Comment	Normal
					14/06/2022 10:20	1973974	3328		3400	Absent	Absent		7.6	Absent	26.5	Absent		No Comment	Normal
					19/06/2022 15:30	1975640	5974		2000	Absent	Absent		7.4	Absent	20.4	Absent		No Comment	Normal
					27/06/2022 10:40	1978140	710		250	Absent	Absent		7.9	Absent	29.7	Absent		No Comment	Normal
					28/06/2022 11:20	1978739	192		690	Absent	Absent		7.9	Absent	33	Absent		No Comment	Normal
					03/07/2022 13:45	1980640	6152		1255	Absent	Absent		7.6	Absent	26	Absent		No Comment	Normal
					11/07/2022 10:30	1983582	4494		3800	Absent	Absent		7.7	Absent	26.4	Absent		No Comment	Normal
					17/07/2022 13:50	1985953	10		1	Absent	Absent		7.9	Absent	32.5	Absent		Dogs	Normal
					25/07/2022 10:25	1988490	1014		>2000	Absent	Absent		7.8	Absent	29.1	Absent		Birds	Normal
					26/07/2022 10:55	1989008	3578		945	Absent	Absent		7.7	Absent	25.4	Absent		Birds	Normal
					08/08/2022 09:05	1992537	1040		300	Absent	Absent		7.9	Absent	31.3	Absent		No Comment	Normal
					09/08/2022 13:00	1993348	24066		>20000	Absent	Absent		7.6	Absent	23.2	Absent		No Comment	Normal
					14/08/2022 00:00	1994907	1918		530	Absent	Absent		7.6	Absent	21.7	Absent		No Comment	Normal
					22/08/2022 10:05	1997782	2492		88	Absent	Absent		7.7	Absent	28.4	Absent		No Comment	Normal
					23/08/2022 09:05	1998303	426		610	Absent	Absent		7.8	Absent	30.7	Absent		Birds	Normal
					29/08/2022 12:10	2000288	2028		660	Absent	Absent		7.7	Absent	24.7	Absent		Dogs & Birds	Normal
					06/09/2022 09:20	2003539	538		470	Absent	Absent		8	Absent	29.4	Absent		No Comment	Normal
					11/09/2022 12:10	2005208	150		390	Absent	Absent		7.9	Absent	31.7	Absent		Birds	Normal
					13/09/2022 14:30	2006131	9208		580	Absent	Absent		7.4	Absent	21.9	Absent		No Comment	Normal
					Number	**19**	**19**		**19**										
					26/09/2022 14:10	2010395	5702		6300	Absent	Absent		7.7	Absent	25	Absent		No Comment	Normal

						19/06/2022 16:20	1975642	<10		2	Ectocarpus Present	Absent		8.1	Absent	34.9	Absent		No Comment	Ectocarpus present
						27/06/2022 11:25	1978142	97		5	Absent	Absent		8	Absent	32.6	Absent		Dogs	Normal
						28/06/2022 12:10	1978741	122		125	Absent	Absent		8	Absent	31.9	Absent		No Comment	Normal
						03/07/2022 14:40	1980642	<10		28	Absent	Absent		8	Absent	30.9	Absent		No Comment	Normal
						11/07/2022 10:05	1983584	31		9	Absent	Absent		8	Absent	33.8	Absent		Dogs & Birds	Normal
						17/07/2022 14:20	1985955	<10	<1		Absent	Absent		8	Absent	34.1	Absent		Dogs	Normal
						25/07/2022 09:50	1988492	63		13	Ectocarpus Present	Absent		8	Absent	34.2	Absent		Dogs & Birds	Ectocarpue present
						26/07/2022 11:55	1989010	41		6	Absent	Absent		8.1	Absent	34.3	Absent		Dogs & Birds	Normal
						08/08/2022 08:45	1992539	393		75	Absent	Absent		8	Absent	34.7	Absent		Dogs & Birds	Normal
						09/08/2022 11:30	1993350	52		16	Absent	Absent		8	Absent	34.2	Absent		No Comment	Normal
						14/08/2022 12:50	1994909	<10		2	Absent	Absent		8	Absent	33.9	Absent		Dogs	Normal
						22/08/2022 09:35	1997784	52		11	Absent	Absent	9	8.1	Absent	33.1	Absent		Dogs & Birds	Normal
						23/08/2022 09:45	1998305	97		17	Absent	Absent		8.1	Absent	33.4	Absent		Birds	Normal
						29/08/2022 13:00	2000290	52		5	Absent	Absent		8.2	Absent	34.1	Absent		Dogs & Birds	Normal
						06/09/2022 10:00	2003541	1553		250	Absent	Absent		8	Absent	32.8	Absent		Dogs	Normal
						11/09/2022 12:50	2005210	1014		880	Absent	Absent		8.2	Absent	31.8	Absent		No Comment	Normal
						13/09/2022 15:40	2006133	10		16	Absent	Absent		8.1	Absent	32.7	Absent		No Comment	Normal
						Number	**19**	**19**	**1**	**18**										
						26/09/2022 13:40	2010397	86		20	Ectocarpus Present	Absent		8.2	Absent	33.1	Absent		Birds	Ectocarpus Present
DCC	**ASW 18**	**121_BEA_DCC**		**40553**	**(40553) Merrion Strand (non-identified BW**	25/05/2022 08:15	1966965	62		14	Absent	Absent		8	Absent	33.4	Absent		Dogs	Normal
						13/06/2022 11:40	1973248	<10		3	Absent	Absent		8	Absent	34.2	Absent		No Comment	Normal
						14/06/2022 11:10	1973977	41		25	Absent	Absent		8	Absent	34.8	Absent		No Comment	Normal
						19/06/2022 16:40	1975643	<10		6	Ectocarpus Present	Absent		8.1	Absent	34.3	Absent		No Comment	Ectocarpus present
						27/06/2022 11:45	1978143	10		2	Absent	Absent		8.1	Absent	33.1	Absent		Birds	Normal
						28/06/2022 12:30	1978742	132		32	Absent	Absent		8	Absent	32.2	Absent		No Comment	Normal
						03/07/2022 14:10	1980643	52		3	Ectocarpus Present	Absent		7.9	Absent	34.6	Absent		No Comment	Ectocarpus present
						11/07/2022 09:50	1983585	41		13	Absent	Absent		8	Absent	33.9	Absent		Birds	Normal
						17/07/2022 14:00	1985956	63		15	Absent	Absent		8.1	Absent	35.8	Absent		No Comment	Normal
						25/07/2022 09:35	1988493	844		33	Ectocarpus Present	Absent		8	Absent	33.8	Absent		Dogs & Birds	Ectocarpue present
						26/07/2022 12:20	1989011	<10		6	Ectocarpus Present	Absent		8.1	Absent	34	Absent		Birds	Ectocarpus present
						08/08/2022 08:30	1992540	98		14	Ectocarpus Present	Absent		8	Absent	33.6	Absent		Birds	Ectocarpus present
						09/08/2022 11:45	1993351	30		72	Absent	Absent		8	Absent	34.8	Absent		No Comment	Normal
						14/08/2022 00:00	1994910	121		13	Absent	Absent		8	Absent	35.4	Absent		Dogs	Normal
						22/08/2022 09:10	1997785	341		220	Absent	Absent		8	Absent	32.3	Absent		Birds	Normal
						23/08/2022 10:05	1998306	677		75	Ectocarpus Present	Absent		8.1	Absent	33.4	Absent		Birds	Ectocarpus present
						29/08/2022 13:25	2000291	41		11	Absent	Absent		8.1	Absent	33.9	Absent		Birds	Normal
						06/09/2022 14:20	2003542	14136		>2000	Absent	Absent		8.1	Absent	31.4	Absent		No Comment	Normal
						11/09/2022 12:35	2005211	246		80	Absent	Absent		8.2	Absent	29.4	Absent		No Comment	Normal
						13/09/2022 16:00	2006134	41		20	Absent	Absent		8.4	Absent	32.8	Absent		No Comment	Normal
						Number	**19**	**19**		**19**										
						26/09/2022 13:20	2010398	31		31	Absent	Absent		8.3	Absent	32.3	Absent		Birds	Normal

ATTACHMENT D.2.4:

RINGSEND INFLUENT AND EFFLUENT PRIORITY SUBSTANCES SCREENING 2022

D.2.4 Ringsend Influent and Effluent Priority Substances Screening 2022

To comply with condition **4.11.1** of Licence D0034-01, 2 sub-samples of the Ringsend composite influent and effluent were analysed in 2022 for a comprehensive suite of parameters from the:

- PRTR test suite
- EPA's 54 parameter test suite (Appendix 1, EPA Guidance on the Screening for Priority
  Substances for Waste Water Discharge Licences) which was issued on 17/01/11.

D.2.4.1 SBR Effluent Screening 2022:

Effluent Sample Reference 2032237 taken on 30/11/2022.

See **Table 1.** Many of the parameters tested for the PRTR suite in this effluent sample were reported as below the detection limit.

Parameters from the EPA's Guidance document detected in this effluent sample are highlighted in **Table 1**. These included low (microgram and sub-microgram per litre) levels of:

VOCs: Chloroform was detected at 1.16 ug/l.

Pesticides / Herbicides :
Diuron was detected at 0.02 ug/l.
Glyphosate was detected at 0.318 ug/l.
Mecoprop was detected at 0.08 ug/l.
MCPA was detected at 0.70 ug/l.

Metals: The metals Lead (3.2 ug/l), (Arsenic (1.7 ug/l), Copper (31 ug/l), Zinc (104 ug/l), Cadmium (0.07 ug/l), Mercury (0.052 ug/l), Chromium (2.5 ug/l), Selenium(1.0 ug/l), Molybdenum (4.4 ug/l), Barium (26.0 ug/l), Boron (0.152 mg/l), Cobalt (0.77 ug/l), Vanadium (0.94 ug/l) and Nickel (5.1 ug/l) were detected.

Results for other general parameters and additional tests were in the normal range for effluent sewage.

Table 1. Ringsend Effluent Sample 2032237 - 2022 Screening

EPA Parameters Screened for in Waste Water Discharges

No.	Compound	Result	Group of Compounds
1.	Benzene	< 0.10 ug/l	**VOC's**
2.	Carbon Tetrachloride	< 1.00 ug/l	
3	1,2-Dichloroethane	< 1.00 ug/l	
4	Dichloromethane	< 1.00 ug/l	
	Bromodichloromethane	< 1.00 ug/l	
5	Tetrachloroethylene	< 1.00 ug/l	
6	Trichloroethylene	< 1.00 ug/l	
7	Trichlorobenzene (1,2.4)	< 10.00 ng/l	
8	Trichloromethane (Chloroform)	**1.16 ug/l**	
9	Xylenes (all isomers)	< 0.30 ug/l	
10	Ethyl Benzene	< 0.10 ug/l	
11	Toluene	< 0.10 ug/l	
12	Naphthalene	< 0.100 ug/l	**PAH's**
13	Fluoranthene	< 0.100 ug/l	
14	Benzo(k)fluoranthene	< 0.100 ug/l	
15	Benzo(ghi)perylene	< 0.100 ug/l	
16	Indeno(1,2,3-c,d)pyrene	< 0.100 ug/l	
17	Benzo(b)fluoranthene	< 0.100 ug/l	
18	Benzo(a)pyrene	< 0.100 ug/l	
	Acenaphthene	< 0.100 ug/l	
	Pyrene	< 0.100 ug/l	
	Anthracene	< 0.100 ug/l	
	Fluorene	< 0.100 ug/l	
	Phenanthrene	< 0.100 ug/l	
	Benz(a)anthracene	< 0.100 ug/l	
		< 0.100 ug/l	**Total PAH's**
19	Di(2-ethylhexyl)phthalate (DEHP)	< 50 ug/l	**Plasticisers**
	Diethyl Phthalate	< 50 ug/l	
20	Isodrin	< 8 ng/l	**Pesticides**
21	Dieldrin	< 9 ng/l	
22	Diuron	**0.02 ug/l**	
23	Isoproturon	< 0.01 ug/l	
24	Atrazine	< 0.029 ug/l	
25	Simazine	< 0.036 ug/l	
26	Glyphosate	**0.318 ug/l**	
27	Mecoprop	**0.08 ug/l**	
28	2,4-D	< 0.10 ug/l	
29	MCPA	**0.70 ug/l**	
30	Linuron	< 0.01 ug/l	
31	Dichlobenil	< 5 ng/l	
32	2,6-Dichlorobenzamide	N/A*	
	Diazinon	< 0.013 ug/l	
	Dimethoate	< 0.020 ug/l	

No.	Compound	Result	Group of Compounds
33	PCB's (Sum of 7)	< 0.039 ug/l	**PCB's**
34	Phenols	< 25.0 ug/l	**Phenols**
	m,p- Methylphenol	< 5.0 ug/l	**Cresols**
	o- Methylphenol	< 5.0 ug/l	
35	Lead (Total as Pb)	**3.2 ug/l**	**Metals**
36	Arsenic (Total as As))	**1.7 ug/l**	
37	Copper (Total as Cu)	**31.0 ug/l**	
38	Zinc (Total as Zn)	**104 ug/l**	
39	Cadmium (Total as Cd)	**0.07ug/l**	
40	Mercury (Total as Hg)	**0.052 ug/l**	
41	Chromium (Total as Cr)	**2.5 ug/l**	
42	Selenium (Total as Se)	**1.00 ug/l**	
43	Antimony (Total as Sb)	< 1.6 ug/l	
44	Molybdenum (Total as Mo)	**4.4 ug/l**	
45	Tin (Total as Sn)	< 1.6 ug/l	
	Organo-Tin	N/A	
	Tributyl Tin	N/A	
46	Barium (Total as Ba)	**26.0 ug/l**	
47	Boron (Total as B)	**0.152 mg/l**	
48	Cobalt (Total as Co)	**0.77 ug/l**	
49	Vanadium (Total as V)	**0.94 ug/l**	
50	Nickel (Total as Ni)	**5.1 ug/l**	
51	Fluoride (as F)	0.6 mg/l	**General**
52	Chloride (as Cl)	331 mg/l	
53	TOC (as C)	-	
54	Cyanide (Total as CN)	< 9 ug/l	
55	Sulphate (Total as SO4)	108 mg/l	
	(Sample 2032227)		
56	Conductivity	1560 uS/cm (20 degrees C)	**Additional Tests**
57	Hardness (mg/l CaCO3)	N/A	
58	pH	7.5	

Assessment of the Significance of the Discharge SW1 on Receiving Water Quality - 2022

A summary of effluent screening results is presented below with a limited assessment of the significance of the discharge on receiving water. Note that the SBR effluent results are sampled at the licensed point of discharge and that a mixing zone boundary has not been defined in WWDL D0034-01.

SBR Effluent from primary discharge receives a significant dilution within the undefined near field mixing zone before receiving water standards are applicable.

Chromium (Total), Copper and Zinc were the only metals screened in the effluent sample that exceeded the EQS's set for the receiving waters.

A minimum dilution factor of 2 to 6 in the near field mixing zone allows for compliance with the EQS's for specific pollutants which are set as an annual average (AA).

This assessment does not indicate a significant impact from the specific pollutants listed for the receiving waters outside the near field of the primary discharge point.

Table 2 Assessment of the Significance of the Primary Discharge on Receiving Water Environmental Quality Standards for Specific Pollutants (Table 10, S.I. No. 272 of 2009, as amended)

Specific Pollutant Parameter	AA-EQS (ug/l)	Effluent 1909233 (01/12/21)
		SW1
Arsenic	20	1.7
Chromium VI	0.6	**2.5***
Copper	5	**31.0**
Cyanide	10	< 9
Diazinon	0.01	< 0.013
Dimethoate	0.8	< 0.020
Fluoride	1,500	600
Glyphosate	-	0.318
Linuron	0.7	< 0.01
Mancozeb	2	-
Monochlorobenzene	25	< 1.0
Phenols	8	**< 25.0**
Toluene	10	**<0.10**
Xylenes	10	**< 0.30**
Zinc	40	**104**

* = Total Chromium which is > Chromium VI

D.2.4.2 Ringsend Influent Screening 2022:

To comply with condition **4.11.2 of Licence D0034-01**, a sample of the Ringsend influent was analysed during 2022 (on 30/11/22) – same date as the effluent sample reported above, for agglomeration regulation purposes.

Investigation of the sources of any dangerous substances detected in monitoring of the influent was carried out by monitoring the 4 incoming lines to the plant on 30/11/2022.

Samples were tested for:

- PRTR test suite
- EPA's 54 parameter test suite (Appendix 1, EPA Guidance on the Screening for Priority Substances for Waste Water Discharge Licenses) issued on 17/01/11.

Summary of Influent Screening Results:

2022 – Influent Sample Reference 2032236 of 30/11/22.

See **Table 3.** Many of the parameters tested for the PRTR suite in this influent sample were reported as below the detection limit.

Parameters from the EPA's Guidance document detected in this influent sample included low (sub-microgram and microgram per litre) concentrations of:

VOCs and BTEX compounds:

Tri-chloromethane was detected at 3.36 ug/l.

Toluene was detected at 2.6 ug/l.

PAH's: Naphthalene (0.412 ug/l), Pyrene (0.121 ug/l), Fluorene (0.19 ug/l) and Phenanthrene (0.326 ug/l) were detected. All other PAH's were reported as below the detection limit.

Pesticides / Herbicides: Glyphosate was detected at 0.38 ug/l.

Phenols: Phenols were detected at 88.3 ug/l.

Metals: The metals Lead (5.1 ug/l), Copper (38.0 ug/l), Zinc (275 ug/l), Mercury (0.045 ug/l), Barium (34.0 ug/l), Cobalt (1 ug/l) and Vanadium (1.3 ug/l) were detected.

See highlighted parameters in **Table 3**.

Results for general parameters and additional tests were in the normal range for influent sewage.

Table 3 - EPA Appendix 1 – Ringsend Influent Sample 2032236 – 2022 PRTR Screening

EPA Parameters Screened for in Waste Water Discharges

No.	Compound	Result	Group of Compounds
1.	Benzene	< 0.10 ug/l	**VOC's**
2.	Carbon Tetrachloride	< 1.00 ug/l	
3	1,2-Dichloroethane	< 1.00 ug/l	
4	Dichloromethane	< 1.00 ug/l	
	Bromodichloromethane	< 1.00 ug/l	
5	Tetrachloroethylene	< 1.00 ug/l	
6	Trichloroethylene	< 1.00 ug/l	
7	Trichlorobenzene (1,2.4)	< 1.00 ng/l	
8	Trichloromethane	**3.36 ug/l**	
9	Xylenes (all isomers)	< 3.00 ug/l	
10	Ethyl Benzene	< 1.0 ug/l	
11	Toluene	**2.6 ug/l**	
12	Naphthalene	**0.412 ug/l**	**PAH's**
13	Fluoranthene	< 0.100 ug/l	
14	Benzo(k)fluoranthene	< 0.100 ug/l	
15	Benzo(ghi)perylene	< 0.100 ug/l	
16	Indeno(1,2,3-c,d)pyrene	< 0.100 ug/l	
17	Benzo(b)fluoranthene	< 0.100 ug/l	
18	Benzo(a)pyrene	< 0.100 ug/l	
	Acenaphthene	< 0.100 ug/l	
	Pyrene	**0.121 ug/l**	
	Anthracene	< 0.100 ug/l	

No.	Compound	Result	Group of Compounds
	Fluorene	**0.19 ug/l**	
	Phenanthrene	**0.326 ug/l**	
	Benzo(a)anthracene	< 0.100 ug/l	
		1.05 ug/l	**Total PAH's**
19	Di(2-ethylhexyl)phthalate (DEHP)	< 50 ug/l	**Plasticisers**
	Diethyl Phthalate	< 50.0 ug/l	
20	Isodrin	< 28 ng/l	**Pesticides**
21	Dieldrin	< 34 ng/l	
22	Diuron	< 0.10 ug/l	
23	Isoproturon	< 0.10 ug/l	
24	Atrazine	< 0.114 ug/l	
25	Simazine	< 0.142 ug/l	
26	Glyphosate	**0.38 ug/l**	
27	Mecoprop	< 0.16 ug/l	
28	2,4-D	< 2.00 ug/l	
29	MCPA	< 2.00 ug/l	
30	Linuron	< 0.10 ug/l	
31	Dichlobenil	< 17 ng/l	
32	2,6-Dichlorobenzamide	N/A	
	Diazinon	< 0.047ug/l	
	Dimethoate	< 0.029 ug/l	
33	PCB's (Sum of 7)	< 0.136 ug/l	**PCB's**
34	Phenols	**88.3 ug/l**	**Phenols**
	m,p- Methylphenol	< 5.00 ug/l	**Cresols**
	o- Methylphenol	< 5.00 ug/l	
35	Lead (Total as Pb)	**5.1 ug/l**	**Metals**
36	Arsenic (Total as As)	< 2.4 ug/l	
37	Copper (Total as Cu)	**38 ug/l**	
38	Zinc (Total as Zn)	**275 ug/l**	
39	Cadmium (Total as Cd)	< 0.7 ug/l	
40	Mercury (Total as Hg)	**0.045 ug/l**	
41	Chromium (Total as Cr)	< 5.1 ug/l	
42	Selenium (Total as Se)	< 6.0 ug/l	
43	Antimony (Total as Sb)	<16 ug /l	
44	Molybdenum (Total as Mo)	< 27.0 ug/l	
45	Tin (Total as Sn))	< 15.0 ug/l	
	Organo-Tin	N/A	
	Tributyl Tin	N/A	
46	Barium (Total as Ba)	**34.0 ug/l**	
47	Boron (Total as B)	< 0.600 mg/l	
48	Cobalt (Total as Co)	**1 ug/l**	
49	Vanadium (Total as V)	**1.3 ug/l**	
50	Nickel (Total as Ni)	< 10 ug/l	
51	Fluoride (as F)	0.6 mg/l	**General**

No.	Compound	Result	Group of Compounds
52	Chloride	324 mg/l	
53	TOC	N/A	
54	Cyanide	< 9 ug/l	
55	Sulphate (Total as SO4)	69.5 mg/l	
	(Sample 2032226)		
56	Conductivity	1590 uS/cm (20 degrees C)	**Additional Tests**
57	Hardness (mg/l CaCO3)	N/A	
58	pH	7.4	

Summary of Influent Lines Screening Results 2022:

2022 – Influent Lines:

To isolate the source of parameters detected in the Influent, samples were taken from the 4 main influent feeder lines on 30/11/2022 as follows:

- 1909412 : Dun Laoghaire – West Pier
- 1909413 : Dodder Valley Sewer - UCD FM-10
- 1909414 : North Dublin Drainage System – Sutton Sump
- 1909415 : Ringsend – Main Lift Pumping Station

See **Table 4.** These samples were tested for the PRTR test suite. Many of the parameters in the influent feeder line samples were reported as below the detection limit.

Parameters detected in the 4 feeder lines have been compared with those detected in the influent sample (see **Table 3** above).

2032491 : Dun Laoghaire – West Pier

Only 1 parameter from the Volatile Organic Carbons suite was detected in this sample - Trichloromethane (3.86 ug/l).

The BTEX compound Toluene was detected at 0.54 ug/l.

The Herbicide compound Glyphosate was detected in this sample (0.132 ug/l).

Phenols (94.4 ug/l) and the cresol m,p-Methyl Phenol (72.1 ug/l) were detected in this sample.

The metals Lead (2.2 ug/l), Arsenic (2.4 ug/l), Copper (31 ug/l), Zinc (69 ug/l), Mercury (0.132 ug/l), Chromium (0.72 ug/l), Selenium (1.5 ug/l), Molybdenum (3.3 ug/l), Barium (31 ug/l), Boron (0.099 mg/l), Cobalt (0.17 ug/l), Vanadium (0.55 ug/l) and Nickel (2.1 ug/l) were detected.

See highlighted parameters in **Table 4**.

2032492: Dodder Valley Sewer - UCD FM-10

Only 1 parameter from the Volatile Organic Carbons suite was detected in this sample - Trichloromethane (5.58 ug/l).

The BTEX compounds Xylenes (0.38 ug/l) and Toluene (0.5 ug/l) were detected.

The Herbicide compound Glyphosate was detected in this sample (0.117 ug/l).

Phenols were detected at 149 ug/l and the cresol m,p- Methyl Phenol at 136 ug/l.

The metals Lead (1.7 ug/l), Arsenic (1.3 ug/l), Copper (32 ug/l), Zinc (72 ug/l), Cadmium (0.09 ug/l) Mercury (0.038 ug/l),,Chromium (0.93 ug//), Selenium (0.84 ug/l), Tin (2.5 ug/l), Barium (24 ug/l), Cobalt (0.28 ug/l), Vanadium (0.58 ug/l) and Nickel (1.6 ug/l) were detected.

See highlighted parameters in **Table 4**.

1909414: North Dublin Drainage System – Sutton Sump

Only 1 parameter from the Volatile Organic Carbons suite was detected in this sample - Trichloromethane (4.84 ug/l).

The BTEX compound Toluene was detected at 0.72 ug/l.

The Herbicide compound Glyphosate was detected at 0.149 ug/l.

Phenols (110 ug/l) and the cresol m,p- Methyl Phenol (192 ug/l) were detected.

The metals Lead (2.0 ug/l), Arsenic (1.2 ug/l), Copper (65 ug/l), Zinc (70 ug/l), Cadmium (0.08 ug/l) Chromium (6.8 ug/l), Selenium (0.77ug/l), Tin (3.0 ug/l), Barium (48 ug/l), Boron (0.074 mg/l), Cobalt (0.31 ug/l), Vanadium (0.60 ug/l) and Nickel (6.7 ug/l) were detected in this sample.

See highlighted parameters in **Table 4.**

1909415: Ringsend – Main Lift Pumping Station

1 parameter from the Volatile Organic Carbons suite was detected in this sample – Trichloromethane (5.10 ug/l).

The BTEX compounds Benzene (0.33 ug/l), Toluene (1.79 ug/l), Ethyl Benzene (0.27 ug/l) and Xylenes (0.54 ug/l) were all detected.

The PAHs Naphthalene (0.623 ug/l) and Phenanthrene (0.157 ug/l) were detected in this sample.

The Herbicide compound Glyphosate was detected in this sample (0.128 ug/l)

Phenols (49.5 ug/l) and the cresol m,p-Methylphenol (114 ug/l) were detected in this sample.

The metals Lead (0.65 ug/l), Arsenic (2.1 ug/l), Copper (23 ug/l), Zinc (32 ug/l), Mercury (0.032 ug/l), Chromium (0.65 ug/l), Antimony (1.6 ug/l), Molybdenum (4 ug/l), Barium (25 ug/l), Boron (0.154 mg/l), Cobalt (0.35 ug/l), Vanadium (0.58 ug/l) and Nickel (1.9 ug/l) were detected.

See highlighted parameters in **Table 4.**

Measures to Reduce Detected Priority Substances

Ongoing reviews of trade effluent licenses and consents are carried out in the catchments upstream of the 4 influent lines to the Ringsend WWTP to reduce detected priority substances.

Table 4 - Ringsend Influent Inflows - 2022 PRTR Screening

EPA Parameters Screened for in 4 Waste Water Influent Lines to the Ringsend WwTP

No.	Compound	2032491 Dun Laoire West Pier	2032492 UCD FM 10 (Dodder)	2032493 Sutton Sump	2032494 Ringsend Main Lift
1.	Benzene	<0.50 ug/l	<0.10 ug/l	<0.50 ug/l	**0.33 ug/l**
2.	Carbon Tetrachloride	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
3	1,2-Dichloroethane	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
4	Dichloromethane	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
	Bromodichloromethane	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
5	Tetrachloroethylene	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
6	Trichloroethylene	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
7	Trichlorobenzene (1,2,4)	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l	<1.00 ug/l
8	Trichloromethane	**3.86 ug/l**	**5.58 ug/**l	**4.84 ug/l**	**5.10 ug/l**
9	Xylenes (all isomers)	<1.50 ug/l	**0.38 ug/l**	<1.50 ug/l	**0.54 ug/l**
10	Ethyl Benzene	<0.50 ug/l	<0.10 ug/l	<0.50 ug/l	**0.27 ug/l**
11	Toluene	**0.54 ug/l**	**0.5 ug/l**	**0.72 ug/l**	**1.79 ug/l**
12	Naphthalene	<0.50 ug/l	<0.50 ug/l	<0.50 ug/l	**0.623 ug/l**
13	Fluoranthene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
14	Benzo(k)fluoranthene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100ug/l
15	Benzo(ghi)perylene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
16	Indeno(1,2,3-c,d)pyrene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
17	Benzo(b)fluoranthene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
18	Benzo(a)pyrene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
	Acenaphthene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
	Pyrene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
	Anthracene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
	Fluorene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	<0.100 ug/l
	Phenanthrene	<0.100 ug/l	<0.500 ug/**l**	<0.100 ug/l	**0.157 ug/l**
	Benzo(a)anthracene	<0.100 ug/l	<0.500 ug/l	<0.100 ug/l	< 0.100 ug/l

No.	Compound	2032491 Dun Laoire West Pier	2032492 UCD FM 10 (Dodder)	2032493 Sutton Sump	2032494 Ringsend Main Lift
	Total PAH's	<0.500ug/l	<0.500 ug/l	<0.500 ug/l	**0.78 ug/l**
19	Di(2-ethylhexyl)phthalate (DEHP)	< 50 ug/l	< 50 ug/l	< 50 ug/l	< 50 ug/l
	Di-ethylphthalate	< 50 ug/l	< 50 ug/l	< 50 ug/l	< 50 ug/l
20	Isodrin	<28 ng/l	< 28 ng/l	< 28 ng/l	< 28 ng/l
21	Dieldrin	<34 ng/l	< 34 ng/l	< 34 ng/l	< 34 ng/l
22	Diuron	<0.50 ug/l	< 0.50 ug/l	< 0.50 ug/l	< 0.05 ug/l
23	Isoproturon	<0.50 ug/l	< 0.50 ug/l	< 0.50 ug/l	< 0.50 ug/l
24	Atrazine	<0.114 ug/l	< 0.114 ug/l	< 0.114 ug/l	< 0.114 ug/l
25	Simazine	<0.142 ug/l	< 0.142 ug/l	< 0.142 ug/l	< 0.142 ug/l
26	Glyphosate	**0.132 ug/l**	**0.117ug/l**	**0.149 ug/l**	**0.128 ug/l**
27	Mecoprop	<1.60 ug/l	< 1.60 ug/l	< 1.60 ug/l	< 1.60 ug/l
28	2,4-D	<2.00 ug/l	< 2.00 ug/l	< 2.00 ug/l	< 2.00 ug/l
29	MCPA	<2.00 ug/l	< 2.00 ug/l	< 2.00 ug/l	< 2.00 ug/l
30	Linuron	<0.50 ug/l	< 0.50 ug/l	< 0.50 ug/l	< 0.50 ug/l
31	Dichlobenil	<17 ng/l	< 17 ng/l	< 17 ng/l	< 17 ng/l
32	2,6-Dichlorobenzamide	N/A	N/A	N/A	N/A
	Diazinon	<0.047 ug/l	<0.047 ug/l	<0.047 ug/l	<0.047 ug/l
	Dimethoate	<0.029 ug/l	<0.029 ug/l	<0.029 ug/l	<0.029 ug/l
33	PCB's (Sum of 7)	< 0.136 ug/l	< 0.136 ug/l	< 0.136 ug/l	< 0.136ug/l
34	Phenols	**94.4 ug/l**	**149 ug/l**	**110 ug/l**	**49.5 ug/l**
34	m,p- Methylphenol	**72.1 ug/l**	**136 ug/l**	**192 ug/l**	**114 ug/l**
	o- Methylphenol	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
35	Lead	**2.2 ug/l**	**1.7 ug/l**	**2.0 ug/l**	**0.65ug/l**
36	Arsenic	**2.4 ug/l**	**1.3 ug/l**	**1.2 ug/l**	**2.1 ug/l**
37	Copper	**31 ug/l**	**32 ug/l**	**65 ug/l**	**23 ug/l**
38	Zinc	**69 ug/l**	**72 ug/l**	**70 ug/l**	**32 ug/l**
39	Cadmium	<0.07 ug/l	**0.09 ug/l**	**0.08 ug/l**	< 0.07 ug/l
40	Mercury	**0.132 ug/l**	**0.038 ug/l**	< 0.010 ug/l	**0.032 ug/l**
41	Chromium	**0.72 ug/l**	**0.93 ug/l**	**6.8 ug/l**	**0.65 ug/l**
42	Selenium	**1.5 ug/l**	**0.84 ug/l**	**0.77 ug/l**	< 0.60 ug/l
43	Antimony	<1.6 ug/l	<1.6 ug/l	<1.6 ug/l	**1.6 ug/l**

No.	Compound	2032491 Dun Laoire West Pier	2032492 UCD FM 10 (Dodder)	2032493 Sutton Sump	2032494 Ringsend Main Lift
44	Molybdenum	**3.3 ug/l**	<2.7 ug/l	<2.7 ug/l	**4 ug/l**
45	Tin (Total)	<1.5 ug/l	**2.5 ug/l**	**3.0 ug/l**	< 1.5 ug/l
	Organo Tin	N/A	N/A	N/A	N/A
	Tri-Butyl Tin	N/A	N/A	N/A	N/A
46	Barium	**31 ug/l**	**24 ug/l**	**48 ug/l**	**25 ug/l**
47	Boron	**0.099 mg/l**	< 0.060mg/l	**0.074 mg/l**	**0.154 mg/l**
48	Cobalt	**0.17 ug/l**	**0.28 ug/l**	**0.31 ug/l**	**0.35 ug/l**
49	Vanadium	**0.55 ug/l**	**0.58 ug/l**	**0.60 ug/l**	**0.58 ug/l**
50	Nickel	**2.1 ug/l**	**1.6 ug/l**	**6.7 ug/l**	**1.9 ug/l**
51	Fluoride	0.5 mg/l	0.5 mg/l	0.5 mg/l	0.6 mg/l
52	Chloride	75 mg/l	49.5 mg/l	122 mg/l	480 mg/l
53	TOC	-	-	-	-
54	Cyanide	< 9 ug/l	< 9 ug/l	< 9 ug/l	< 9 ug/l
55	Sulphate (Total as SO4)	45.8 mg/l	33.9 mg/l	17 mg/l	105 mg/l
		(Sample 2032486)	**(Sample 2032487)**	**(Sample 2032488)**	**(Sample 2032489)**
55	Conductivity	752	717	914	1514
56	Hardness (mg/l CaCO3)	-	-	-	-
57	pH	7.6	7.6	7.3	7.6