Annual Environmental Report

2021

UISCE ÉIREANN : IRISH WATER

Lower Liffey Valley Regional Sewerage Scheme

D0004-02

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0004-02, Lower Liffey Valley Regional Sewerage Scheme, in Kildare in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified reports where relevant are included as an appendix to the AER.

1.1 ANNUAL STATEMENT OF MEASURES

A summary of any improvements undertaken is provided where applicable.

The following works were carried out in 2021:

- PLC's upgraded.
- Ferric dosing automation installed.
- Caustic bulk storage and dosing system installed.

An automatic control of caustic dosing is planned for 2022.

1.2 TREATMENT SUMMARY

The agglomeration is served by a wastewater treatment plant(s)

- Lower Liffey Valley WWTP with a Plant Capacity PE of 150000, the treatment type is 3NP - Tertiary N&P removal.

1.3 ELV OVERVIEW

The overall compliance of the final effluent with the Emission Limit Values (ELVs) is shown below. More detailed information on the below ELV’s can be found in Section 2.

Discharge Point Reference	Treatment Plant	Discharge Type	Compliance Status	Parameters failing if relevant
TPEFF1400D0004SW001	Lower Liffey Valley WWTP	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
There are no Licence Specific Reports included in this AER.

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 LOWER LIFFEY VALLEY WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - LOWER LIFFEY VALLEY WWTP

A summary of influent monitoring for the treatment plant is presented below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

Parameters	Number of Samples	Annual Max	Annual Mean
ortho-Phosphate (as P) - unspecified mg/l	25	5.15	2.89
Total Phosphorus (as P) mg/l	27	9.57	4.22
Ammonia-Total (as N) mg/l	27	48	31
Total Nitrogen mg/l	27	79	53
COD-Cr mg/l	27	796	439.68
Suspended Solids mg/l	27	560	234.41
BOD, 5 days with Inhibition (Carbonaceous) mg/l	27	464	236
pH pH units	25	7.62	7.36
Hydraulic Capacity	N/A	52938	36904

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 2.1.5 if applicable.

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional 'Operational Performance Summary'. The design of the wastewater treatment plant allows for peak values and therefore the peak loads have not impacted on compliance with Emission Limit Values.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF1400D0004SW001

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included [Note 1]	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	28	N/A	N/A	16	Pass
Suspended Solids mg/l	35	87.5	N/A	28	N/A	N/A	3.74	Pass
pH pH units	6.00	9.00	N/A	28	N/A	N/A	6.70	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	4.00	8.00	N/A	28	N/A	N/A	1.00	Pass
Total Phosphorus (as P) mg/l	1.00	1.20	N/A	28	N/A	N/A	0.100	Pass
Ammonia-Total (as N) mg/l	0.500	1.00	N/A	28	N/A	N/A	0.078	Pass
ortho-Phosphate (as P) - unspecified mg/l	0.100	0.200	N/A	28	N/A	N/A	0.049	Pass

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included [Note 1]	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
Total Oxidised Nitrogen (as N) mg/l	N/A	N/A	N/A	26	N/A	N/A	15	
True Colour PtCo Units	N/A	N/A	N/A	26	N/A	N/A	13	
Nitrate (as N) mg/l	N/A	N/A	N/A	26	N/A	N/A	15	
Total Nitrogen mg/l	N/A	N/A	N/A	26	N/A	N/A	17	
Fluoride mg/l	N/A	N/A	N/A	28	N/A	N/A	2.50	
Nitrite (as N) mg/l	N/A	N/A	N/A	25	N/A	N/A	0.023	
Appearance (on Sampling) Descriptive	N/A	N/A	N/A	26	N/A	N/A	N/A	

Notes:
1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied
2 – For pH the WWDA specifies a range of pH 6 - 9

Cause of Exceedance(s):

Not applicable

Significance of Results:

The WWTP is compliant with the ELV's set in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF1400D0004SW001

A summary of monitoring from ambient monitoring points associated with the wastewater discharge is provided in the sections below. For discharges to rivers upstream (U/S) and downstream (D/S) location data is provided. For other ambient points in lakes, coastal or transitional waters, monitoring data from the most appropriate monitoring station is selected.

The table below provides details of ambient monitoring locations and details of any designations as sensitive areas.

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	River Station Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Ecological Status
Upstream	301516, 235804	RS09L011940	No	No	No	No	Unassigned
Downstream	302295, 235190	RS09L012040	No	No	No	No	Unassigned

The table below provides a summary of monitoring results for designated ambient monitoring points. The upstream and downstream annual mean values are shown (mg/l), and the difference between both monitoring stations is given as a percentage of the Environmental Quality Standard (EQS) where relevant.

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
BOD - 5 days (Total) mg/l	RS09L011940	1.00	RS09L012040	1.00	1.50	0
Ammonia-Total (as N) mg/l	RS09L011940	0.140	RS09L012040	0.133	0.065	-11.5
ortho-Phosphate (as P) - unspecified mg/l	RS09L011940	0.054	RS09L012040	0.048	0.035	-16.3
Dissolved Oxygen % Saturation	RS09L011940	96	RS09L012040	95	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Fluoride mg/l	RS09L011940	0.088	RS09L012040	0.182	N/A	
COD-Cr mg/l	RS09L011940	17	RS09L012040	17	N/A	
pH pH units	RS09L011940	7.59	RS09L012040	7.68	N/A	
Total Phosphorus (as P) mg/l	RS09L011940	0.114	RS09L012040	0.097	N/A	
Total Oxidised Nitrogen (as N) mg/l	RS09L011940	2.11	RS09L012040	2.75	N/A	
Dissolved Oxygen mg/l	RS09L011940	10	RS09L012040	10	N/A	
Nitrate (as N) mg/l	RS09L011940	2.07	RS09L012040	2.74	N/A	
Nitrite (as N) mg/l	RS09L011940	0.023	RS09L012040	0.023	N/A	
Temperature °C	RS09L011940	13	RS09L012040	13	N/A	
Total Nitrogen mg/l	RS09L011940	2.68	RS09L012040	3.45	N/A	
True Colour PtCo Units	RS09L011940	58	RS09L012040	57	N/A	
Suspended Solids mg/l	RS09L011940	4.50	RS09L012040	5.14	N/A	

Significance of Results:

The WWTP discharge was compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results do not meet the required EQS at the upstream and the downstream monitoring locations. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

The discharge from the wastewater treatment plant does not have an observable impact on the water quality.

The Lower Liffey Valley agglomeration was listed as a pressure in the Cycle 2 Liffey and Dublin Bay Catchment Report (HA 09) Catchment Report but has been removed from the list of significant pressures in Cycle 3.

Based on the above and the effluent compliance results, it is considered that the discharge from the wastewater treatment plant does not have an observable negative impact on the WFD status. However, it should be noted that the WFD status upstream and downstream of the WWTP is currently Unassigned.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - LOWER LIFFEY VALLEY WWTP

2.1.4.1 Treatment Efficiency Report - Lower Liffey Valley WWTP

Treatment efficiency is based on the removal of key pollutants from the influent wastewater by the treatment plant. In essence the calculation is based on the balance of load coming into the plant versus the load leaving the plant. The efficiency is presented as a percentage removal rate.

A summary presentation of the efficiency of the treatment process including information for all the parameters specified in the licence is included below:

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
cBOD	3120467	13333	100
SS	3098145	49886	98
TP	55781	1331	98
COD	5811304	216069	96
TN	706043	225870	68

Note: The above data is based on sample results for the number of dates reported

2.1.4.2 Treatment Capacity Report Summary - Lower Liffey Valley WWTP

Treatment capacity is an assessment of the hydraulic (flow) and organic (the amount of pollutants) load a treatment plant is designed to treat versus the current loading of that plant.

Lower Liffey Valley WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	65405
DWF to the Treatment Plant (m^3/day)	48500
Current Hydraulic Loading - annual max (m^3/day)	52938
Average Hydraulic loading to the Treatment Plant (m^3/day)	36904
Organic Capacity (PE) - As Constructed	150000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	138675
Organic Capacity (PE) - Remaining	11325
Will the capacity be exceeded in the next three years? (Yes/No)	No

Nominal design capacities can be based on conservative design principles. In some cases assessment of existing plants has shown organic capacities significantly higher than the nominal design capacity. Accordingly plants that appear to be overloaded when comparing a collected peak load with the nominal design capacity can be fully compliant due to the safety factors in the original design.

2.1.5 SLUDGE / OTHER INPUTS - LOWER LIFFEY VALLEY WWTP

'Other inputs' to the waste water treatment plant are summarised in table below

Input type	Quantity	Unit	P.E.	% of load to WWTP	Included in Influent Monitoring (Y/N)?	Is there a leachate/sludge acceptance procedure for the WWTP?	Is there a dedicated leachate/sludge acceptance facility for the WWTP? (Y/N)
Domestic /Septic Tank Sludge	21840	Weight (Tonnes)	266	0.16	Yes	Yes	Yes
Industrial / Commercial Sludge	9360	Weight (Tonnes)	114	0.07	Yes	Yes	Yes
Landfill Leachate (delivered by tanker)	807	Weight (Tonnes)	9.8	0.06	Yes	Yes	Yes

3 COMPLAINTS AND INCIDENTS

3.1 COMPLAINTS SUMMARY

A summary of complaints of an environmental nature related to the discharge(s) to water from the WWTP and network is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2021.			

3.2 REPORTED INCIDENTS SUMMARY

Environmental incidents that arise in an agglomeration are reported on an on-going basis in accordance with our waste water discharge licences. Where an incident occurs and it is reportable under the licence, it is reported to the Environmental Protection Agency through their Environmental Data Exchange Network, or in some instances by telephone. Some incidents which arise in the agglomeration are recorded by Irish Water but may not be reportable under our licence for example where the incident does not have an impact on environmental performance.

A summary of reported incidents is included below.

3.2.1 SUMMARY OF INCIDENTS

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	Yes
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	Yes
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	Yes

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	Yes
Abatement Equipment offline	Plant or equipment breakdown at WWTP	1	No	Yes
Fire	Plant or equipment breakdown at WWTP	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	Blocked Sewer	1	No	No
Uncontrolled release	Broken Sewer Pipe	1	Yes	Yes
Uncontrolled release	Broken Sewer Pipe	1	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	14
Number of Incidents reported to the EPA via EDEN in 2021	14
Explanation of any discrepancies between the two numbers above	N/A

4 INFRASTRUCTURAL ASSESSMENTS AND PROGRAMME OF IMPROVEMENTS

4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT

A summary of the operation of the storm water overflows and their significance where known is included below:

4.1.1 SWO IDENTIFICATION

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
TBC	297590, 233306	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	286684, 240780	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC, TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	298236, 233802	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	288434, 238610	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	288177, 239026	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	287770, 240274	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	299292, 234119	No	Medium	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	300469, 235248	No	Medium	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	293095, 238364	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	296916, 232422	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
SW002	TBC, TBC	Yes	Unknown	Meeting	7	13124	Monitored

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
SW003	288852, 239591	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW004	294407, 238711	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW005	293552, 237349	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW006	298236, 233802	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW007	297590, 233306	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW008	297584, 233306	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW009	297379, 232919	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW010	298651, 233371	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW011	298651, 233385	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored
SW012	296932, 232421	Yes	Unknown	Meeting	Unknown	Unknown	Not Monitored

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
SW013	301155, TBC	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW014	292832, 2296074	Yes	Medium	Meeting	Unknown	Unknown	Not Monitored
SW015	300408, 235903	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW016	30653, TBC	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored

Any TBC SWO(s) were identified as part of the on-going National SWO programme and will be updated in subsequent AER(s) once the information is confirmed.

SWO Summary	
How much sewage was discharged via monitored SWOs in the agglomeration in the year (m^3)?	13124
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	Yes
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	No

4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS

4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Specified Improvement Programmes (under Schedule A and C of WWDL)	Description	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
D0004-SIP:01	Upgrading of Storm Water Overflows to comply with the criteria outlined in the DoECLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/12/2020	No	Work ongoing on-site	31/12/2023	Primrose hill works ongoing. All other SWOs under DAP assessment.
D0004-SIP:02	Waste Water capacity improvement works	C	08/05/2020	Yes	Works Completed		
D0004-SIP:03	Waste Water Treatment plant improvement and ancillary works to meet the requirements of Schedule A.1 and condition 3.4	C	31/12/2019	Yes	Works Completed		

A summary of the status of any other improvements identified by under Condition 5 assessments- is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
No additional improvements planned at this time.				

4.2.3 SEWER INTEGRITY RISK ASSESSMENT

The utilisation of multiple capital maintenance programmes and the outputs of the workshops with the Local Authority Operations Staff held under the programme can be used to satisfy the requirements of Condition 5 regarding network integrity. Improvement works identified by way of these programmes and workshops will be included in the Improvements Summary Tables 4.2.1 and 4.2.2.

5 LICENCE SPECIFIC REPORTS

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Licence Specific Report	Required by licence	Year included in AER	Included in this AER
Priority Substances Assessment	Yes	2014	No
Toxicity/Leachate Management	Yes	2014	No

6 CERTIFICATION AND SIGN OFF

6.1 SUMMARY OF AER CONTENTS

Parameter	Answer
Does the AER include an Executive Summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e., have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Has a Technical amendment/licence review application been submitted to the Agency by IW?	No
List reason e.g., additional SWO identified	N/A
Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc	Yes
List reason e.g., changes to monitoring requirements	Ambient Monitoring Location Changes
Have these processes commenced?	No
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	N/A

I certify that the information given in this Annual Environmental Report is truthful, accurate and complete:

Date: 22/04/2022

This AER has been produced by Irish Water's Environmental Information System (EIMS) and has been electronically signed off in that system for and on behalf of,

Katherine Walshe

Acting Head of Environmental Regulation.

7 APPENDIX

There are no Appendices included.