

Annual Environmental Report

2019



Carrigtwohill

D0044-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

- 1.1 ANNUAL STATEMENT OF MEASURES
- 1.2 TREATMENT SUMMARY
- 1.3 ELV OVERVIEW
- 1.4 LICENSE SPECIFIC REPORT INCLUDED IN AER

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

- 2.1 CARRIGTOHILL WWTP - TREATED DISCHARGE
 - 2.1.1 INFLUENT SUMMARY - CARRIGTOHILL WWTP
 - 2.1.2 EFFLUENT MONITORING SUMMARY - CARRIGTOHILL WWTP -
 - 2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE -
 - 2.1.4 OPERATIONAL REPORTS SUMMARY FOR CARRIGTOHILL WWTP
 - 2.1.5 SLUDGE/OTHER INPUTS TO CARRIGTOHILL WWTP

3 COMPLAINTS AND INCIDENTS

- 3.1 COMPLAINTS SUMMARY
- 3.2 REPORTED INCIDENTS SUMMARY
 - 3.2.1 SUMMARY OF INCIDENTS
 - 3.2.2 SUMMARY OF OVERALL INCIDENTS

4 INFRASTRUCTURAL ASSESSMENT AND PROGRAMME OF IMPROVEMENTS

- 4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT
 - 4.1.1 SWO IDENTIFICATION AND INSPECTION SUMMARY REPORT
- 4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS
 - 4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY
 - 4.2.2 IMPROVEMENT PROGRAMME SUMMARY
 - 4.2.3 SEWER INTEGRITY RISK ASSESSMENT

5 LICENCE SPECIFIC REPORTS

- 5.1 PRIORITY SUBSTANCES ASSESSMENT
- 5.2 SHELLFISH IMPACT ASSESSMENT

6 CERTIFICATION AND SIGN OFF

- 6.1 SUMMARY OF AER CONTENTS

7 APPENDIX

7.1 AMBIENT MONITORING SUMMARY

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

This Annual Environmental Report has been prepared for D0044-01, Carrigtwohill, in Cork 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.

There was no major capital or operational changes undertaken.

1.2 TREATMENT SUMMARY

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

- Carrigtohill WWTP with a Plant Capacity PE of 30000, 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
TPEFF0500D0044SW001	Carrigtohill WWTP	Treated	Non-Compliant	ortho-Phosphate (as P) - unspecified mg/l Total Phosphorus (as P) mg/l

1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

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

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 CARRIGTOHILL WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - CARRIGTOHILL 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
Suspended Solids mg/l	4	141	113.57
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	4	89	70.76
Total Phosphorus (as P) mg/l	4	7.98	4.63
COD-Cr mg/l	4	464	339.71
Total Nitrogen mg/l	4	41	25.34
Hydraulic Capacity	N/A	13854	4649

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'.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF0500D0044SW001

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 with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	12	N/A	N/A	19.36	Pass
Suspended Solids mg/l	35	87.5	N/A	12	1	N/A	5.36	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	N/A	12	N/A	N/A	2.71	Pass
Total Oxidised Nitrogen (as N) mg/l	20	24	N/A	12	N/A	N/A	6.54	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.49	Pass
Ammonia-Total (as N) mg/l	5	6	N/A	12	N/A	N/A	0.27	Pass
Total Phosphorus (as P) mg/l	1	1.2	N/A	12	2	2	0.62	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.5	0.6	N/A	12	3	2	0.46	Fail
Faecal coliforms no./100mls	N/A	N/A	N/A	2	N/A	N/A	8537.29	

Enterococci (Intestinal) no./100mls	N/A	N/A	N/A	2	N/A	N/A	3.53	
E. Coli no./100mls	N/A	N/A	N/A	2	N/A	N/A	8537.29	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	8.1	

Notes:

1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied

Cause of Exceedance(s):

Exceedances have been caused by accepting leachate to the WWTP, adverse weather conditions and equipment calibration issues.

Significance of Results:

The WWTP is non compliant with the ELV's set in the Wastewater Discharge Licence. The impact on receiving waters is assessed further in Section 2.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0500D0044SW002

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 Status
Downstream	179127, 70773	TW05003153LE6001	No	No	No	Yes	Moderate

The results for ambient results and / or additional monitoring data sets are included in the **Appendix 7.1 - Ambient monitoring summary**

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results does not meet the required EQS. 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 discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - CARRIGTOHILL WWTP

2.1.4.1 Treatment Efficiency Report - Carrigtohill 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)
COD	562623	34316	94
TP	7668	1093	86
cBOD	117194	4797	96
SS	188094	9494	95
TN	41963	14358	66

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

2.1.4.2 Treatment Capacity Report Summary - Carrigtohill 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.

Carrigtohill WWTP	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	20250
DWF to the Treatment Plant (m ³ /day)	6750
Current Hydraulic Loading - annual max (m ³ /day)	13854
Average Hydraulic loading to the Treatment Plant (m ³ /day)	4649
Organic Capacity (PE) - As Constructed	30000
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	10223
Organic Capacity (PE) - Remaining	19777
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 - CARRIGTOHILL 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)
Waterworks Sludge	5967	Volume (m3)		0.35	No	No	No
Landfill Leachate (delivered by tanker)	15948.7	Weight (Tonnes)		0.94	No	No	Yes

3 COMPLAINTS AND INCIDENTS

3.1 COMPLAINTS SUMMARY

A summary of complaints of an environmental nature is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2019.			

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)
Breach of ELV	Leachate Acceptance at WWTP	1	Yes	Yes
Uncontrolled release	Adverse Weather	1	No	Yes
Breach of ELV	Plant or equipment calibration at WWTP	1	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2019	3
Number of Incidents reported to the EPA via EDEN in 2019	3
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	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2019 (No. of events)	Total volume discharged in 2019 (m3)	Monitoring Status
TBC	TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
SW003	181268, 72266	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW004	181182, 72317	Yes	Low	Not yet Assessed	Unknown	Unknown	Not Monitored
SW01	179911, 72583	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	TBC	No	Low	Meeting	Unknown	Unknown	Not Monitored

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	N/A
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 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
D0044-SIP:01	Installation of new WWTP to meet ELVs as specified in Schedule A	C	31/12/2016	Yes	Works Completed		
D0044-SIP:02	Installation of storm water holding tank (SW003)	C	31/12/2016	Yes	Works Completed		

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
D0044-SIP:03	Installation of storm water holding tank (SW004)	C	31/12/2016	Yes	Works Completed		
D0044-SIP:04	Nutrient removal to meet ELVs as specified in Schedule A	C	31/12/2016	Yes	Works Completed		
D0044-SIP:05	SW002 Primary Discharge Point to be discontinued	C	31/12/2016	Yes	Works Completed		

A summary of the status of any improvements identified by under Condition 5.2 is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
There are no Improvements Programme for this Agglomeration.				

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 Table.

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 list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER
Priority Substances Assessment	Yes	2014	No	
Shellfish Impact Assessment	Yes	-	No	

5.1 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2014.

5.2 SHELLFISH IMPACT ASSESSMENT

The Shellfish Impact Assessment Report has not been included in the AER.

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
Is there a need to advise the EPA for consideration of a Technical Amendment / Review of the licence?	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	No
List reason e.g. changes to monitoring requirements	N/A
Have these processes commenced?	N/A
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:

Signed: Date: 22/04/2020

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

Appendix

Appendix 7.1 - Ambient monitoring summary

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)				Current WFD Status	Mean (mg/l)		
			Bathing Water	Drinking Water	FWPM	Shellfish		cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point							Good			
Downstream Monitoring Point		TW05003153LE6001	No	No	No	No	Moderate	2.750	0.037	0.145
<i>Difference</i>								2.750	0.037	0.145
EQS								1.500	0.035	0.065
% of EQS								183.333%	105.714%	223.462%

Carrigtohill	Transitional						Median	Mean	95%ile
	EQS								
	Mean	95%ile	13/03/2019	08/05/2019	07/08/2019	02/10/2019			
D.O % O ₂	80%<95%ile<120%		101.1	98.4	138.8	94.2			133.145
Temperature C°	≤ 1.5 C° increase		8.1	11.8	18.4	13.9			
pH	6 < pH < 9		7.9	7.9	8.3	7.8			
BOD mg/L	n/a	≤ 4	1.3	1.9	6	1.8		2.75	5.385
Orthophosphate (P) mg/l	≤0.04 @35 PSU (Median)		0.038	0.02	0.05	0.04	0.039	0.037	
Ammonia (N) mg/l	≤ 0.065	≤ 0.140	0.201	0.13	0.13	0.12		0.14525	0.19035
TON (N) mg/l	n/a			0.44	0.01	0.5			
E.Coli MPN/100mls	n/a		2755	912	359	683			
Faecal Coliforms MPN/100mls	n/a		2489	2247	231	1126			
Intestinal enterococci CFU/100mls	n/a		221	435	5	122			

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	EPA Feature Coding tool Code	Bathing Water	Drinking Water	FWPM	Shellfish	Current WFD Status
Downstream Monitoring Point		TW05003153LE6001	No	No	No	No	Moderate

Significance of Results	
Did the ambient monitoring results meet the EQS Required?	No
Is there an observable negative impact on water quality?	Unknown - "observable" TBC
List the parameters causing the impact?	Ammonia, DO % Sat, BOD
A deterioration has been identified, but it is not known if it is caused by the TP	TRUE
Do the discharges from the WWTP have an observable negative impact on the WFD?	Unknown - "observable" TBC
Any other known impacts	Catchment Pressures, diffuse urban

