Annual Environmental Report

2020

Shannon Town

D0045-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2020 AER

This Annual Environmental Report has been prepared for D0045-01, Shannon Town, in Clare 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.

1.2 TREATMENT SUMMARY

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

- Shannon Town WWTP - 2020 with a Plant Capacity PE of 12500, the treatment type is 2 - Secondary treatment.
    - The treatment process consists of two process streams: a domestic stream and an industrial stream. Since 21 December 2016, the domestic and industrial streams were combined into one stream at the new inlet works and are being balanced and combined before treatment.
    - Treated wastewater discharges to a large final effluent lagoon before discharge to the Shannon Estuary via an outfall pipe and diffuser.

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
TPEFF0300D0045SW001	Shannon Town WWTP - 2020	Treated	Non-Compliant	BOD, 5 days with Inhibition (Carbonaceo mg/l Suspended Solids 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 SHANNON TOWN WWTP - 2020 - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - SHANNON TOWN WWTP - 2020

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
COD-Cr mg/l	24	761	292.54
BOD, 5 days with Inhibition (Carbonaceo mg/l	24	339	140.04
Total Nitrogen mg/l	24	47.6	19.63
Suspended Solids mg/l	24	326	124.20
Total Phosphorus (as P) mg/l	24	8.36	3.43
Hydraulic Capacity	N/A	31187	13134

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 greater 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 - TPEFF0300D0045SW001

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	59.58	Pass
Ammonia-Total (as N) mg/l	35	42	N/A	12	N/A	N/A	14.55	Pass
Suspended Solids mg/l	35	87.5	N/A	12	2	1	32.68	Fail
BOD, 5 days with Inhibition (Carbonaceo mg/l	25	50	N/A	12	5	0	23.6	Fail
Temperature °C	25	25	N/A	7	N/A	N/A	14.86	Pass
Total Oxidised Nitrogen (as N) mg/l	15	18	N/A	10	N/A	N/A	1.46	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.66	Pass
Cadmium - filtered mg/l	N/A	N/A	N/A	10	N/A	N/A	N/A	
Copper - unfiltered mg/l	N/A	N/A	N/A	10	N/A	N/A	0.07	

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)
Nitrate (as NO3) mg/l	N/A	N/A	N/A	12	N/A	N/A	1.32	
Chromium - filtered mg/l	N/A	N/A	N/A	10	N/A	N/A	0.01	
Lead - filtered mg/l	N/A	N/A	N/A	12	N/A	N/A	0.01	
Silver - unspecified mg/l	N/A	N/A	N/A	12	N/A	N/A	N/A	
Cyanide (unspecified) mg/l	N/A	N/A	N/A	10	N/A	N/A	0.01	
ortho-Phosphate (as P) - unspecified mg/l	N/A	N/A	N/A	12	N/A	N/A	1.24	
Sulphate mg/l	N/A	N/A	N/A	12	N/A	N/A	124.22	
Selenium - filtered mg/l	N/A	N/A	N/A	12	N/A	N/A	N/A	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	2.09	

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)
Zinc - unspecified mg/l	N/A	N/A	N/A	12	N/A	N/A	0.17	
Mercury - filtered mg/l	N/A	N/A	N/A	12	N/A	N/A	N/A	
Kjeldahl Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	15.06	
Arsenic - filtered mg/l	N/A	N/A	N/A	10	N/A	N/A	N/A	
Nickel - filtered mg/l	N/A	N/A	N/A	12	N/A	N/A	0.01	
Phenols (Total) mg/l	N/A	N/A	N/A	10	N/A	N/A	0.01	
Fats, Oils & Greases mg/l	N/A	N/A	N/A	10	N/A	N/A	1.34	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	16.46	
Conductivity @25°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	1134.64	

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):

The WWTP was under upgrade in 2020.

Significance of Results:

Upgrade works are almost complete at Shannon WWTP. Q3 of 2020 showed an improvement in results with full compliance with ELVs

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0300D0045SW001

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	138528, 159128	TW03004128SN2006	No	No	No	No	Poor
Downstream	144527, 159156	TW03004128SN2005	No	No	No	No	Poor

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 - SHANNON TOWN WWTP - 2020

2.1.4.1 Treatment Efficiency Report - Shannon Town WWTP - 2020

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)
TP	2109	4792	-127.17
TN	11325	37815	-233.9
COD	179457	136852	24
cBOD	86946	54204	38
SS	73138	75072	-2.64

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

2.1.4.2 Treatment Capacity Report Summary - Shannon Town WWTP - 2020

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.

Shannon Town WWTP - 2020	
Peak Hydraulic Capacity (m^3/day) - As Constructed	13686
DWF to the Treatment Plant (m^3/day)	6312

Shannon Town WWTP - 2020	
Current Hydraulic Loading - annual max (m^3/day)	31187
Average Hydraulic loading to the Treatment Plant (m^3/day)	13134
Organic Capacity (PE) - As Constructed	12500
Organic Capacity (PE) - Collected Load (peak week)[Note1]	17164
Organic Capacity (PE) - Remaining	0
Will the capacity be exceeded in the next three years? (Yes/No)	Yes

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 - SHANNON TOWN WWTP - 2020

'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)
Landfill Leachate (delivered by sewer network)	63884	Volume (m3)		2.69	Yes	Yes	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 2020.			

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	Inadequate Infrastructure	1	Yes	No
Uncontrolled release	Broken Sewer Pipe	1	No	Yes
Uncontrolled release	Broken Sewer Pipe	1	No	Yes

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	Broken Sewer Pipe	1	No	Yes
Spillage	Other	1	No	No
Uncontrolled release	Broken Sewer Pipe	1	No	No
Uncontrolled release	Plant or equipment maintenance at WWTP	1	No	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2020	7
Number of Incidents reported to the EPA via EDEN in 2020	7
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 2020 (No. of events)	Total volume discharged in 2020 (m3)	Monitoring Status
SW2	143382, 159984	Yes	Low	Meeting	Unknown	Unknown	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?	No
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?	N/A

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
D0045-SIP:01	Refurbish the existing WWTP and upgrade it, resulting in a capacity to treat a population equivalent of 35,000.	C	31/12/2015	Yes	Work ongoing on-site	Upgrade complete April 2021	

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
There is no Licence Specific Report Required in this AER Annual Review.				

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?	N/A
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	N/A
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	Yes

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

Signed: Date: 20/05/2021

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

MonitoringStationCode	MonitoringStationName	SampleDate	ParameterName	ParameterUnitShortCode	Result	TextResult
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Ammonia-Total (as N)	mg/l	0.051	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Ammonia-Total (as N)	mg/l	0.055	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Ammonia-Total (as N)	mg/l	0.046	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Ammonia-Total (as N)	mg/l	0.048	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Chlorophyll	Âµg/l		<2
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Chlorophyll	Âµg/l	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Chlorophyll	Âµg/l		<2
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Chlorophyll	Âµg/l	5	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Chlorophyll	Âµg/l	4.2	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Chlorophyll	Âµg/l	4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Depth	m	0	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Depth	m	6.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Depth	m		nm
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Depth	m		nm
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Dissolved Oxygen	% Saturation	101	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Dissolved Oxygen	% Saturation	100	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Dissolved Oxygen	% Saturation	101	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Dissolved Oxygen	% Saturation	100.5	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.019	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.021	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.058	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	pH	pH units	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	pH	pH units	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.028	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Salinity	PSU	4.57	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.022	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Salinity(Lab)	0/oo	22.4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Salinity(Lab)	0/oo	22.4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Salinity	PSU	0.36	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Salinity	PSU	22.7	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Salinity	PSU	20.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Salinity(Lab)	0/oo	3.8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	StationDepth	m	8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Salinity(Lab)	0/oo	19.8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Temperature	Â°C	16.4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Silica (as SiO2)	mg/l	4.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	pH	pH units	8.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	pH	pH units	8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Silica (as SiO2)	mg/l	1.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Silica (as SiO2)	mg/l	0.92	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Total Oxidised Nitrogen (as N)	mg/l	1.2	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Temperature	Â°C	16.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Temperature	Â°C	20.4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Temperature	Â°C	18.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Silica (as SiO2)	mg/l	0.19	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Silica (as SiO2)	mg/l	0.2	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	StationDepth	m	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	StationDepth	m	6.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	StationDepth	m	6.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Total Oxidised Nitrogen (as N)	mg/l	0.31	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Total Oxidised Nitrogen (as N)	mg/l	0.31	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Total Oxidised Nitrogen (as N)	mg/l	0.39	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Total Oxidised Nitrogen (as N)	mg/l	0.27	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Temperature	Â°C	5.81	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Transparency	m	0.5	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Transparency	m	0.5	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Ammonia-Total (as N)	mg/l	0.043	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Transparency	m	0.2	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Transparency	m	0.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Transparency	m	0.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Ammonia-Total (as N)	mg/l	0.031	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Depth	m		nm
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Depth	m		nm
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Dissolved Oxygen	% Saturation	99.7	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Dissolved Oxygen	% Saturation	93	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.034	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	pH	pH units	8.2	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	pH	pH units	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	18/06/2020	Salinity	PSU	22.8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Salinity	PSU	13.3	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Salinity(Lab)	0/oo	0.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	Salinity(Lab)	0/oo	13.6	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Silica (as SiO2)	mg/l	3.7	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	StationDepth	m	8.1	
TW03004128SN2006	SN330 - Carraig Bank Buoy	11/08/2020	StationDepth	m	8	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Temperature	Â°C	5.651	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Total Oxidised Nitrogen (as N)	mg/l	1.4	
TW03004128SN2006	SN330 - Carraig Bank Buoy	19/02/2020	Transparency	m	0.2	

MonitoringStationCode	MonitoringStationName	SampleDate	ParameterName	ParameterUnitShortCode	Result	TextResult
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Ammonia-Total (as N)	mg/l	0.091	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Ammonia-Total (as N)	mg/l	0.038	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Ammonia-Total (as N)	mg/l	0.055	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Ammonia-Total (as N)	mg/l	0.11	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Ammonia-Total (as N)	mg/l	0.073	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	BOD - 5 days (Total)	mg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	BOD - 5 days (Total)	mg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Chlorophyll	Âµg/l	5.9	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Chlorophyll	Âµg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Chlorophyll	Âµg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Chlorophyll	Âµg/l	11	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Chlorophyll	Âµg/l	4.8	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Depth	m	5.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Depth	m	0	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Dissolved Oxygen	% Saturation	104	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Dissolved Oxygen	% Saturation	104	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Dissolved Oxygen	% Saturation	95	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Dissolved Oxygen	% Saturation	101	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Dissolved Oxygen	% Saturation	91	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.018	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.023	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.033	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	pH	pH units	8.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	pH	pH units	8.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	pH	pH units	8.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Salinity	PSU	0.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.039	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.044	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Salinity	PSU	14.8	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Silica (as SiO2)	mg/l	4.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	StationDepth	m	7.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	StationDepth	m	7.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	StationDepth	m	5.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Salinity(Lab)	0/oo	15.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Salinity(Lab)	0/oo	16	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Salinity(Lab)	0/oo	4.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	StationDepth	m	7.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Temperature	Â°C	18.9	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Silica (as SiO2)	mg/l	0.51	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	pH	pH units	8.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	pH	pH units	8.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	TOC (as NPOC)	mg/l	7.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	StationDepth	m	7.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Total Oxidised Nitrogen (as N)	mg/l	1.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Salinity	PSU	0.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Total Oxidised Nitrogen (as N)	mg/l	0.57	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Salinity	PSU	16.6	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Transparency	m	0.4	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Transparency	m	0.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Transparency	m	0.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Transparency	m	0.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Temperature	Â°C	5.7	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Temperature	Â°C	5.7	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Salinity(Lab)	0/oo	0.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Temperature	Â°C	20.4	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	TOC (as NPOC)	mg/l	9.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	TOC (as NPOC)	mg/l	3.9	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Silica (as SiO2)	mg/l	4.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Silica (as SiO2)	mg/l	1.4	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	StationDepth	m	5.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Total Oxidised Nitrogen (as N)	mg/l	0.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Total Oxidised Nitrogen (as N)	mg/l	0.39	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Temperature	Â°C	16.7	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Temperature	Â°C	16.5	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	TOC (as NPOC)	mg/l	9.2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Total Oxidised Nitrogen (as N)	mg/l	1.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Total Oxidised Nitrogen (as N)	mg/l	0.41	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Ammonia-Total (as N)	mg/l	0.042	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Transparency	m	0.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	BOD - 5 days (Total)	mg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	BOD - 5 days (Total)	mg/l		<1
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Chlorophyll	Âµg/l	5.3	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Dissolved Oxygen	% Saturation	99	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	ortho-Phosphate (as P) - unspecified	mg/l	0.026	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	pH	pH units	8	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Salinity	PSU	3.7	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Salinity	PSU	14.9	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Salinity(Lab)	0/oo	0.1	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Salinity(Lab)	0/oo	12.7	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	18/06/2020	Silica (as SiO2)	mg/l	0.58	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	11/08/2020	Silica (as SiO2)	mg/l	2	
TW03004128SN2005	SN310 - TRADREE (Bunratty Buoy)	19/02/2020	Transparency	m	0.4	