Annual Environmental Report

2021

Killenaule

D0443-01

CONTENTS

7.1 Small Stream Risk Score Assessment

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0443-01, Killenaule, in Tipperary 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)

- KILLENAULE WWTP with a Plant Capacity PE of 1200, the treatment type is 3P - Tertiary 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
TPEFF2900D0443SW001	KILLENAULE WWTP	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 KILLENAULE WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - KILLENAULE 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
Ammonia-Total (as N) mg/l	12	83	17
Total Phosphorus (as P) mg/l	12	14	2.42
Total Nitrogen mg/l	12	92	24
pH units	12	8.10	7.38
Suspended Solids mg/l	12	295	68
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	492	84
COD-Cr mg/l	12	715	190
Hydraulic Capacity	N/A	913	291

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'. 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 - TPEFF2900D0443SW001

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	50	100	N/A	12	N/A	N/A	7.01	Pass
Temperature °C	25	25	N/A	11	N/A	N/A	13	Pass
pH units	9.00	9.00	N/A	12	N/A	N/A	7.54	Pass
Suspended Solids mg/l	5.00	12	N/A	12	1	N/A	3.71	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	4.00	8.00	N/A	12	N/A	N/A	1.38	Pass
Ammonia-Total (as N) mg/l	1.00	2.00	N/A	12	N/A	N/A	0.038	Pass
ortho-Phosphate (as P) - unspecified mg/l	0.500	0.600	N/A	12	N/A	N/A	0.039	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)
Nitrite (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.158	
Conductivity @20°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	477	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.094	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	11	
Nitrate (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	8.28	

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 TPEFF2900D0443SW001

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	222485, 146124	RS16K050070	No	No	No	No	Moderate
Downstream	222586, 145961	RS16K050080	No	No	No	No	Moderate

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	RS16K050070	1.41	RS16K050080	2.01	1.50	39.5
Ammonia-Total (as N) mg/l	RS16K050070	0.067	RS16K050080	0.454	0.065	595.5
ortho-Phosphate (as P) - unspecified mg/l	RS16K050070	0.077	RS16K050080	0.075	0.035	-4.8
Dissolved Oxygen mg/l	RS16K050070	10	RS16K050080	10	N/A	
Dissolved Oxygen % O2	RS16K050070	99	RS16K050080	98	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
Temperature °C	RS16K050070	11	RS16K050080	12	N/A	
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	RS16K050070	1.41	RS16K050080	1.41	N/A	
pH units	RS16K050070	8.27	RS16K050080	8.10	N/A	
Total Nitrogen mg/l	RS16K050070	2.12	RS16K050080	4.21	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.

Based on ambient monitoring results a deterioration in Ammonia (Total), BOD 5 Days (Total) and Total Nitrogen., concentrations downstream of the effluent discharge is noted.

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 - KILLENAULE WWTP

2.1.4.1 Treatment Efficiency Report - KILLENAULE 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	12019	197	98
TN	3368	1524	55
SS	9732	528	95
COD	27035	999	96
TP	344	13	96

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

2.1.4.2 Treatment Capacity Report Summary - KILLENAULE 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.

KILLENAULE WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	804
DWF to the Treatment Plant (m^3/day)	268
Current Hydraulic Loading - annual max (m^3/day)	913
Average Hydraulic loading to the Treatment Plant (m^3/day)	291
Organic Capacity (PE) - As Constructed	1200
Organic Capacity (PE) - Collected Load (peak week)[Note1]	909
Organic Capacity (PE) - Remaining	291
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 - KILLENAULE 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)
There is no Sludge and Other Input data for the Treatment Plant included in the AER.							

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)
Spillage	Blocked Sewer	1	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	1
Number of Incidents reported to the EPA via EDEN in 2021	1
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 (m3)	Monitoring Status
SW2	222536, 146042	Yes	Low	Not Meeting	Unknown	Unknown	Monitored
SW3	222515, 146074	Yes	Low	Not Meeting	Unknown	Unknown	Not Monitored
SW5	222403, 146349	Yes	Low	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 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

SWO Summary	
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 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
D0443-SIP:01	Infiltration assessment, a plan for implementation of works and completion of works as agreed under Condition 5 of this licence.	C	15/12/2015	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
Small Stream Risk Score Assessment	Yes	2012	Yes

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	No
List reason e.g. changes to monitoring requirements	N/A
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:

Signed: Date: 21/04/2022

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

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

Comhairle Contae Thiobraid Árann
Tipperary County Council

Comhairle Contae Thiobraid Árann,
Oifigi Cathartha,
Cluain Meala,
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Wastewater Treatment Plant SSRS impact Assessment Summary.

FAO: Flann Real, Exc Scientist, Water Services, Tipperary County Council

From: Paddy O'Dwyer, Exc Scientist, Environment Section, Tipperary Co.Council

Date: 10/12/2021

Re: Small Stream Risk Score Assessment of impacts from Killenaule WWTP on the receiving watercourse (Killenaule Stream)

The scope of this assessment is to ascertain if the WWTP is having a negative impact on the receiving watercourse.

Small Stream Risk Scoring (SSRS) is a method used in conjunction with chemistry analysis to determine the water quality and habitat at a given location. This assessment is concentrated on the macroinvertebrae of the Killenaule stream upstream and downstream of the municipal wastewater Treatment plant discharge point. Table .1. below illustrates the SSRS scores carried out by Tipperary County Council Env Section for the period 2011 – 2021.

Table 1

Killenaule WWTP	*Assessment Date*	*Upstream (Ballingarry Road)*	*Downstream (Drangan Road)*
Killenaule WWTP	2011	**3.2**	**3.2**
Killenaule WWTP	2012	**3.2**	**4**
Killenaule WWTP	2013	**3.2**	**4.8**
Killenaule WWTP	2014	**4**	**5.6**
Killenaule WWTP	05/10/2021	**2.4**	**4.1**

Table 2 below illustrated the risk scores and each is colour coded in association with Table 1 above

Table.2.

SSRS Score	Interpretation
0 - 6.5	At Risk
6.5-7.25	May be at Risk
>7.25	Prob not at Risk

Assessment of Risk Scores:

- Killenaule WWTP is **not** having any significant impact on the quality of the receiving watercourse.
- This watercourse is showing a gradual improvement especially at the location downstream of the WWTP. Overall this watercourse is at risk.
- The main pressures in the upland catchment relate to Agricultural intensification and impacts regarding diffuse and direct discharges. Urban run-off is also a significant pressure on this catchment both upstream and downstream of the wastewater treatment plant.

Recommendation:

Catchment walk and farm inspections are required upstream of Killenaule Town. Investigative assessment of urban run-off also required.

Paddy O'Dwyer,
Executive Scientist,
Environment Section