

# Annual Environmental Report

## 2024



KilmadThomas

D0275-01

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# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0275-01, Kilmacthomas, in Waterford 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 were no major capital or operational changes undertaken.

## 1.2 TREATMENT SUMMARY

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

- Kilmacthomas with a Plant Capacity PE of 2110, 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
TPEFF3100D0275SW001	Kilmacthomas	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 KILMACTHOMAS - TREATED DISCHARGE

#### 2.1.1 INFLUENT MONITORING SUMMARY - KILMACTHOMAS

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	11	449	245
pH pH units	12	7.40	6.90
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	393	173
Ammonia-Total (as N) mg/l	12	63	19
Total Phosphorus (as P) mg/l	11	9.60	4.92
ortho-Phosphate (as P) - unspecified mg/l	12	5.28	1.72
COD-Cr mg/l	12	932	486
Hydraulic Capacity	N/A	1449	439

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 - TPEFF3100D0275SW000

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	12	N/A	N/A	9.26	Pass
Suspended Solids mg/l	35	87.5	N/A	12	N/A	N/A	1.57	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	N/A	12	N/A	N/A	1.67	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.09	Pass
Ammonia-Total (as N) mg/l	5	6	N/A	12	N/A	N/A	0.314	Pass
ortho-Phosphate (as P) - unspecified mg/l	2	2.4	N/A	12	N/A	N/A	0.211	Pass
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	11	N/A	N/A	0.288	

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)
Dissolved Inorganic Nitrogen (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	3.85	
Faecal coliforms no./100mls	N/A	N/A	N/A	8	N/A	N/A	188	

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 TPEFF3100D0275SW000

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	239406, 106142	RS17M010180	No	Yes	Yes	No	Moderate
Downstream	239724, 105581	RS17M010200	No	Yes	Yes	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
Ammonia-Total (as N) mg/l	RS17M010180	0.035	RS17M010200	0.020	0.065	-23.2
ortho-Phosphate (as P) - unspecified mg/l	RS17M010180	0.007	RS17M010200	0.011	0.035	10.5
Total Nitrogen mg/l	RS17M010180	3.28	RS17M010200	3.12	N/A	
Temperature °C	RS17M010180	11	RS17M010200	12	N/A	
pH pH units	RS17M010180	7.50	RS17M010200	7.39	N/A	
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	RS17M010180	0.756	RS17M010200	0.923	N/A	
Dissolved Oxygen % O2	RS17M010180	93	RS17M010200	92	N/A	

### Significance of Results:

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

The ambient monitoring results meet the required EQS. 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 BOD 5 days with inhibition, ortho-Phosphate, Temperature, concentrations downstream of the effluent discharge is noted.

A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.

Other causes of deterioration in water quality in the area are unknown.

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 - KILMACTHOMAS

### 2.1.4.1 Treatment Efficiency Report - Kilmacthomas

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	28056	265	99
TP	692	39	94
TN	N/A	N/A	N/A
COD	78677	1464	98
SS	41718	248	99

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

### 2.1.4.2 Treatment Capacity Report Summary - Kilmacthomas

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.

Kilmacthomas	
Peak Hydraulic Capacity (m³/day) - As Constructed	1424
DWF to the Treatment Plant (m³/day)	475
Current Hydraulic Loading - annual max (m³/day)	1449
Average Hydraulic loading to the Treatment Plant (m³/day)	439.43
Organic Capacity (PE) - As Constructed	2110
Organic Capacity (PE) - Collected Load (peak week) <sup>Note1</sup>	1300
Organic Capacity (PE) - Remaining	810
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 - KILMACTHOMAS

'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 2024.			

#### 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 Uisce Éireann 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	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No

Incident Type	Cause	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No
Uncontrolled release	SWO Exceptional rainfall	No	No
Uncontrolled release	SWO exceptional rainfall and overflow expected	No	No

### 3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2024	12
Number of Incidents reported to the EPA via EDEN in 2024	12
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 2024 (No. of events)	Total volume discharged in 2024 (m3)	Monitoring Status
SW002	239527, 105779	Yes	Low Significance	Meeting Criteria	Unknown	4466	Monitored

The contents presented in this table include the most up to date information available at the time of writing. 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 wastewater discharge by metered SWOs during the year (m3)?	4466
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?	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
<b>D0275-SIP:01</b>	SW1 (Primary discharge point until provision of secondary WWTP)	A	31/10/2014	Yes	Works Completed		
<b>D0275-SIP:02</b>	SW2 - Provision of Storm Water Overflows to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/10/2014	Yes	Works Completed		
<b>D0275-SIP:03</b>	Waste Water treatment plant and ancillary works	C	31/10/2014	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	Included in this AER
D0275-01-Drinking Water Abstraction Point Risk Assessment	Yes	No
D0275-01-Pearl Mussel Report	Yes	No
D0275-01-Small Stream Risk Score Assessment	Yes	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
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	No

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

Signed:    Date: 28/05/2025

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

Eleanor Roche

Head of Environmental Regulation.

# 7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

# **SSRS Compliance Monitoring: *Kilmacthomas* Waste Water Treatment Plant 2024**



**Report to Uisce Éireann**  
**Limnos Consultancy, January 2025**

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# Kilmacthomas WWTP

## Introduction

Small Streams Risk Score (SSRS) assessments on the Mahon River upstream and downstream of the Kilmacthomas waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 4 October 2024. Limnos Consultancy was contracted by Irish Water to undertake the surveys.

## Methodology

### Small Streams Risk Score (SSRS)

Samples were taken using an ISO compliant kick-sampling method compatible with the Environmental Protection Agency (EPA) Standard Operating Procedure for sampling aquatic macroinvertebrates. Samples were taken upstream and downstream of the discharge from the WWTP. SSRS results were assigned based on the macroinvertebrate fauna.

The author was the main initiator of the SSRS system developed by the Western River Basin District and the EPA under his supervision in 2005–2006 (McGarrigle 2014). He has undertaken SSRS training of local authority and other professional staff at the Local Government Water Services Training Centres around the country for over 100 personnel.

The SSRS was calculated based on selected sub-groups of the macroinvertebrates recorded. The score is calculated based on the number of taxa and their relative abundance in four main invertebrate groups as follows:

Group 1: Ephemeroptera (excluding *Baetis rhodani*)

Group 2: Plecoptera

Group 3: Trichoptera

Group 4: GOLD (Gastropoda, Oligochaeta, Diptera)

Group 5: *Asellus*

The first three groups above, mayflies, stoneflies, and caddis flies, are regarded as pollution-sensitive whereas gastropods, oligochaetes, dipterans and *Asellus* are relatively pollution-tolerant. The maximum score that can be achieved is 11.2 and threshold scores deciding the degree of risk of not being at good ecological status are as follows:

- > 7.25 Probably not at risk
- > 6.5 to 7.25 Indeterminate
- < 6.5 Stream may be at risk.

Samples were taken with a standard 1 mm mesh pond net. A 3-minute kick sample was combined with a 1-minute stonewash. Samples were placed on a white tray and, once cleaned of debris such as leaves and twigs and excessive sand or gravel by decanting and hand picking, the sample was examined carefully to identify the macroinvertebrates. At least 25 minutes were spent identifying and assigning each taxon found to a relative abundance category. Table 1 gives the definition of the relative abundance terms Few, Common, Numerous, Dominant and Excessive. The numeric code is used in the results tables below.

***Table 1. Relative abundance table.***

<b>Abundance</b>	<b>Number of Individual Specimens</b>	<b>Relative abundance numeric code</b>
Few:	1 to 5 individuals	1
Common:	6 to 20	2
Numerous:	21–50	3
Dominant:	51 to 100	4
Excessive:	>100	5

### Physico-Chemical Measurements

Physico-chemical measurements were also made for dissolved oxygen, temperature and conductivity using a HACH HQ40d meter with appropriate compatible probes. Probes were calibrated before use.



### Location of Sites Sampled

Figure 1 maps the sampling sites and Table 2 gives the details of the locations sampled.



**Figure 1. Location of upstream and downstream monitoring sites for Kilmacthomas WWTP. The river flows South.**

**Table 2. Location of sites sampled upstream and downstream of Kilmacthomas WWTP.**

Location	Kilmacthomas WWTP Upstream	Kilmacthomas WWTP Downstream
<b>EPA Code</b>	RS17M010180	RS17M010200
<b>Station</b>	Bridge in Kilmacthomas	Bridge just South of Kilmacthomas
<b>River</b>	Mahon	Mahon
<b>Easting</b>	239406	239593
<b>Northing</b>	106142	105673

## Results

### Site Photographs

Figure 2 shows photographs taken when sampling on the Mahon River at sites upstream and downstream of the Kilmacthomas WWTP on 4 October 2024.



**Figure 2. Upstream (U/S) and downstream (D/S) of Kilmacthomas WWTP.**

## Macroinvertebrates – SSRS

The taxa are ordered from top to bottom in terms of their SSRS Groupings and general sensitivity to pollution with *Ecdyonurus* at the top being the most sensitive and Tubificidae and *Asellus* at the lower end of the table being the more tolerant. Note that not all recorded taxa are included in the SSRS system – e.g. gammarids, the mayfly, *B. rhodani* are omitted plus beetles, leeches and flatworms are not included either.

Some 17 and 16 taxa were recorded at the upstream and downstream sites, respectively. In 2023 both sites had 14 taxa. In the Ephemeroptera Group 1 *Ecdyonurus* was common at the upstream site and numerous at the downstream site. *Rhithrogena*, which had been present at both sites in December 2023, was absent in October 2024. The stonefly, *Leuctra*, was present at both sites, helping to improve the SSRS score. Five Trichoptera taxa were recorded with *Hydropsyche*, *Limnephilidae*, *Polycentropus* and, *Rhyacophila* at the upstream site and *Rhyacophila* and the cased-caddis, *Sericostoma*, present at the downstream site. In 2023 Simuliidae were numerous at the lower site but only a few of these blackfly larvae occurred in 2024. This helped to bring the SSRS up from 5.6 (at risk) in 2023 to 8.8 in 2024 (not at risk). Together with the ‘numerous’ *Ecdyonurus* this helped to bring the Q-Value up to Q4 from Q3-4 in 2023 at the lower site.

The SSRS at the upstream site at 7.2 places it in the indeterminate band between 6.5 and 7.25. This is a significant decline from the 9.6 scored in December 2023 and may be due in part to the increase in the number of GOLD taxa – up from four to seven, albeit all at low numbers – plus the occurrence of *Asellus* which was not recorded in 2023. Nonetheless, a Q-Value of Q4 was assigned indicating good conditions and status. This is an improvement on the June 2022 EPA sampling when both sites were assigned Q3-4 or moderate status.

Table 3 gives the recorded macroinvertebrate taxa for the standard kick samples taken at these sites.

The taxa are ordered from top to bottom in terms of their SSRS Groupings and general sensitivity to pollution with *Ecdyonurus* at the top being the most sensitive and Tubificidae and *Asellus* at the lower end of the table being the more tolerant. Note that not all recorded taxa are included in the SSRS system – e.g. gammarids, the mayfly, *B. rhodani* are omitted plus beetles, leeches and flatworms are not included either.

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**Table 3. Macroinvertebrates recorded upstream and downstream of Kilmacthomas WWTP discharge point.**

			Upstream Kilmacthomas WWTP	Downstream Kilmacthomas WWTP
		<b>River</b>	<b>Mahon</b>	<b>Mahon</b>
		<b>Code</b>	<b>17M010180</b>	<b>17M010200</b>
		<b>Location</b>	<b>Br in Kilmacthomas</b>	<b>Br just S Kilmacthomas</b>
		<b>Date of Sample</b>	<b>09/10/2024</b>	<b>09/10/2024</b>
SSRS Group		<b>Taxon</b>		
1	Ephem	<i>Ecdyonurus</i>	Common	Numerous
2	Plecoptera	<i>Leuctra</i>	Common	Few
3	Trich	<i>Hydropsyche</i>	Few	Few
3	Trich	Limnephilidae	Few	Few
3	Trich	<i>Polycentropus</i>	Few	-
3	Trich	<i>Rhyacophila</i>	Few	Common
3	Trich	<i>Sericostoma personatum</i>	-	Few
4	GOLD	Chironomidae	-	Few
4	GOLD	<i>Eiseniella</i>	Few	Few
4	GOLD	<i>Lymnaea peregra</i>	Few	Few
4	GOLD	<i>Potamopyrgus antipodarum</i>	Few	-
4	GOLD	Simuliidae	-	Few
4	GOLD	Tipulidae	Few	-
4	GOLD	Tubificidae	Few	Few
5	Asellus	<i>Asellus aquaticus</i>	Few	-
	n/a	<i>Baetis rhodani</i>	Dominant	Common
	n/a	<i>Elmis aenea</i>	Few	Few
	n/a	<i>Gammarus</i>	Numerous	Dominant
	n/a	Goeridae	-	Few
	n/a	Hydraenidae	Few	-
	n/a	<i>Limnius volckmari</i>	Common	Few
		<b>Number Taxa</b>	<b>17</b>	<b>16</b>
		<b>SSRS</b>	<b>7.2</b>	<b>8.8</b>
		<b>Q-Value</b>	<b>Q4</b>	<b>Q4</b>

### Physico-Chemical Results

The physico-chemical measurements made in the field on the day of sampling (Table 4) as in 2023 and 2022 had dissolved oxygen levels close to 100% saturation and a relatively low conductivity and pH due to the geological setting. There was no significant difference between the upstream and downstream sites.

**Table 4. Physico-chemical results for Kilmacthomas River, 4 October 2024.**

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Kilmacthomas WWTP	99.7	10.35	13.00	118	7.18
Downstream Kilmacthomas WWTP	98.8	14.64	13.50	114	7.22

### Summary

Both sites were assigned a Q-Value of Q4 indicating satisfactory conditions. The SSRS values showed a decline from 9.6 to 7.2 at the upper site but an improved score from 5.6 to 8.8 at the lower site. It is concluded that the WWTP did not have a major impact on the river in late 2024.

### Reference

McGarrigle, M. 2014. "Assessment of Small Water Bodies in Ireland." *Biology and Environment* 114B(3). doi: 10.3318/BIOE.2014.15.