Annual Environmental Report

2024

Castledermot

D0236-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0236-01, Castledermot, 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.

There were no capital works, significant changes or operational changes undertaken in 2024.

1.2 TREATMENT SUMMARY

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

- Castledermot WWTP with a Plant Capacity PE of 2400, 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
TPEFF1400D0236SW001	Castledermot WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l ortho-Phosphate (as P) - unspecified mg/l Total Phosphorus (as P) mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 CASTLEDERMOT WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - CASTLEDERMOT 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	12	1230	345
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	455	152
Total Phosphorus (as P) mg/l	12	14	6.89
Total Nitrogen mg/l	12	76	43
Ammonia-Total (as N) mg/l	1	41	41
ortho-Phosphate (as P) - unspecified mg/l	1	2.05	2.05
pH pH units	1	8.14	8.14
COD-Cr mg/l	12	1212	579
Hydraulic Capacity	N/A	1520	523

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 - TPEFF1400D0236SW001

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	22	Pass
Suspended Solids mg/l	30	75	N/A	12	1	N/A	11	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	N/A	12	N/A	N/A	3.16	Pass
pH pH units	6	9	N/A	12	N/A	N/A	7.47	Pass
Total Phosphorus (as P) mg/l	0.7	0.84	N/A	12	2	2	0.442	Fail
Ammonia-Total (as N) mg/l	0.6	1.2	N/A	12	3	2	1.54	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.3	0.6	N/A	12	1	1	0.212	Fail

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 Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	12	

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):

Dosing pump failure or maintenance at WWTP & Biological Sludge Issue at WWTP.

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 TPEFF1400D0236SW001

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	277669, 184624	RS14L010120	No	No	No	No	Poor
Downstream	277507, 184609	RS14L010140	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 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 - CASTLEDERMOT WWTP

2.1.4.1 Treatment Efficiency Report - Castledermot 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	92276	5392	94
cBOD	24236	759	97
TN	6871	2973	57
SS	55060	2668	95
TP	1098	106	90

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

2.1.4.2 Treatment Capacity Report Summary - Castledermot 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.

Castledermot WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1350
DWF to the Treatment Plant (m^3/day)	540
Current Hydraulic Loading - annual max (m^3/day)	1520
Average Hydraulic loading to the Treatment Plant (m^3/day)	523
Organic Capacity (PE) - As Constructed	2400
Organic Capacity (PE) - Collected Load (peak week)[Note1]	2063
Organic Capacity (PE) - Remaining	337
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 - CASTLEDERMOT 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 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
Breach of ELV	Dosing pump failure or maintenance at WWTP	Yes	Yes
Uncontrolled release	Emergency overflow caused by ragging or blocking	No	Yes

Incident Type	Cause	Recurring (Y/N)	Closed (Y/N)
Abatement equipment off-line	Plant or equipment breakdown at WWTP	No	No
Breach of ELV	Dosing pump failure or maintenance at WWTP	Yes	Yes
Breach of ELV	WWTP biological sludge issue	Yes	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2024	6
Number of Incidents reported to the EPA via EDEN in 2024	6
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 (m^3)	Monitoring Status
SW-3	277646, 184620	Yes	Low Significance	Meeting Criteria	Unknown	1088	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 (m^3)?	1088
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
D0236-SIP:01	Upgrade of SWO to comply with the criteria outlined in the DoEHLG "Procedures and criteria in relation to storm water overflows, 1995". SW2	C	31/12/2012	Yes	Works Completed		
D0236-SIP:02	Upgrade of SWO to comply with the criteria outlined in the DoEHLG "Procedures and criteria in relation to storm water overflows, 1995". SW3	C	31/12/2012	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
D0236-01-Priority Substances Assessment	Yes	No
D0236-01-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?	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	Yes

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

Date: 23/04/2025

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 - Ambient Monitoring Summary
Appendix 7.2 - Small Stream Risk Score Assessment

Castledermot Ambient Monitoring Summary 2024

			Receiving Waters Designation (Yes/No)					Mean (mg/l)		
Ambient Monitoring Point from WWDL (or as agreed with EPA)	**Irish National Grid Reference (Easting, Northing)**	**EPA Feature Coding Tool code**	**Bathing Water**	**Drinking Water**	**FWPM**	**Shellfish**	**Current WFD Status**	**cBOD**	**o-Phosphate (as P)**	**Ammonia (as N)**
Upstream Monitoring Point	277669, 184624	RS14L010120	No	No	No	No	Poor	0.905	0.017	0.0334
Downstream Monitoring Point	277507, 184609	RS14L010140	No	No	No	No	Poor	0.832	0.012	0.0297
Difference								*-0.074*	*-0.005*	*-0.0037*
EQS								1.500	0.035	0.065
% of EQS								-4.921%	-13.299%	-5.691%

Castledermot Ambient Monitoring Summary 2024

Upstream Results							
	Date	pH pH units	BOD mg/ l	Total Nitrogen mg/l	Ammonia mg/l	Ortho-Phosphate mg/l	DO mg/l
U/S	30/01/2024	8.29	1.5	7.82	0.04	0.08	11.81
U/S	26/03/2024	8.2	< 1	7	< 0.015	0.02	11.2
U/S	22/04/2024	8.1	< 1	7.3	0.079	< 0.01	7.3
U/S	17/05/2024	8.1	< 1	8.2	0.028	< 0.01	9.5
U/S	17/06/2024	8.1	2	7.1	0.044	< 0.01	9.6
U/S	26/07/2024	8.1	< 1	7.1	< 0.015	0.02	7.4
U/S	14/08/2024	8.1	< 1	7.1	0.067	< 0.01	9.7
U/S	30/08/2024	8.1	< 1	7.5	0.067	< 0.01	8.9
U/S	13/09/2024	8.1	< 1	6.9	0.023	< 0.01	10.9
U/S	23/10/2024	8.1	< 1	6.7	< 0.015	< 0.01	
U/S	14/11/2024	8	< 1	6.9	< 0.015	0.01	10.1
U/S	13/12/2024	8	1	7	< 0.015	0.02	14.1
Mean		**8.108**	**0.905**	**7.218**	**0.0334**	**0.017**	**10.046**
95%ile		**8.241**	**1.725**	**7.991**	**0.0724**	**0.047**	**12.955**

Downstream Results							
	Date	pH pH units	BOD mg/ l	Total Nitrogen mg/l	Ammonia mg/l	Ortho-Phosphate mg/l	DO mg/l
D/S	30/01/2024	8.35	2.2	7.93	0.01	0.04	11.81
D/S	26/03/2024	8.1	< 1	6.7	< 0.015	0.02	10.9
D/S	22/04/2024	8	< 1	7.7	0.047	< 0.01	5.9
D/S	17/05/2024	7.7	< 1	7.9	0.016	< 0.01	9.3
D/S	17/06/2024	8.2	< 1	7.1	< 0.015	< 0.01	9.6
D/S	26/07/2024	8.2	< 1	6.7	0.033	0.02	7.4
D/S	14/08/2024	8.1	< 1	6.9	0.067	< 0.01	9.4
D/S	30/08/2024	8.1	< 1	7.6	0.12	< 0.01	8.6
D/S	13/09/2024	8.2	< 1	6.9	< 0.015	< 0.01	10.8
D/S	23/10/2024	8.1	< 1	6.8	< 0.015	< 0.01	
D/S	14/11/2024	8.1	< 1	7.6	< 0.015	< 0.01	9.8
D/S	13/12/2024	8.1	< 1	6.9	< 0.015	< 0.01	12
Mean		**8.104**	**0.832**	**7.228**	**0.0297**	**0.012**	**9.592**
95%ile		**8.268**	**1.379**	**7.914**	**0.0909**	**0.029**	**11.905**

Note: Where the concentration in the result is less than the limit of detection (LOD), a value of 50% of the LOD was used in calculating the mean and 95%ile concentrations.

Kildare County Council

Castledermot Small Stream Risk Score 2024

Mícheál McHugh Jewell, Daniel Dunleavy

AQUAFACT Ref: P14738

December 2024

Client: Kildare County Council

Address: Devoy Park, Naas Co Kildare W91 X77F

Reference no: P14738

Date of issue: 12/12/2024

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Report Approval Sheet

Client	Kildare County Council
Report Title	Castledermot Small Stream Risk Score 2024
Job Number	P14738
Report Status	Final
Issue Date	02/12/2024

Rev	Status	Issue Date	Document File Name	Author (s)	Approved by:
1	Draft	08/11/2024	P14738 Castledermot SSRS Nov 2024_Draft	Mícheál McHugh Jewell, Daniel Dunleavy	E. McCormack
2	Final	02/12/2024	P14738 Castledermot SSRS Nov 2024_FInal	Mícheál McHugh Jewell, Daniel Dunleavy	E. McCormack

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Appendix 1: Site Photos

Appendix 2: SSRS Datasheets

List of Acronyms/Glossary

D/S	Downstream
EPA	Environmental Protection Agency
G.OL.D	Gastropods, Oligochaetes, Dipterans
IFI	Inland Fisheries Ireland
SSRS	Small Stream Risk Score
U/S	Upstream
WFD	Water Framework Directive
WRBD	Western River Basin District
WWTP	Wastewater Treatment Plant

1. Introduction

AQUAFACT was contracted by Kildare County Council to carry out an SSRS assessment of the discharge belonging to Castledermot wastewater treatment plant. A sample was taken upstream and downstream of the discharge point. The sampling was carried out on the 15th of October 2024.

2. Methodology

2.1 Sampling

Two kick samples were taken (See Figure 2.1 and Table 2.1). The two-minute kick and one minute stone wash sampling method was employed to collect samples of macroinvertebrates for analysis. This involved placing a standard hand net of pore size 500µm in the river, facing upstream and disturbing the riverbed in front of the net mouth. The surveyor then moved in a diagonal direction upstream to ensure that different micro-habitats were included in the sample. The kick sample method dislodges macroinvertebrates from the substrates and submerged plant material. This was continued for approximately two minutes and followed by one minute of stone washing (Lucey *et al*., 1999).

The macroinvertebrate assemblages of each sample were identified and counted on the riverbank. The details of the macroinvertebrate assemblages were recorded on data sheets. The resulting species list was then used to assign the SSRS score to the sampled streams.

The IFI's 2010 Biosecurity Protocol for Field Survey Work document was followed during sampling. Nets and all other equipment were thoroughly disinfected between stations.

Figure 2-1: Upstream and Downstream site positions on the River Lerr at Castledermot

Table 2.1: Castledermot SSRS station coordinates.

Station	Latitude	Longitude
Castledermot Upstream	52.9071780	-6.8459593
Castledermot Downstream	52.9071713	-6.8478906

2.2 Small Stream Risk Score

The Small Streams Risk Score (SSRS) is a biological risk assessment system for identifying rivers that are 'at risk' of failing to achieve the 'good' water quality status goals of the Water Framework Directive (WFD). It was developed by the Environmental Protection Agency (EPA) in association with the Western River Basin District (WRBD) in 2006 and revised in 2009.

The SSRS method is a rapid field methodology for risk assessment that is based solely on macroinvertebrate indicators of water quality and their well-understood response to pollution. Importantly, the SSRS score indicates whether the stream is at risk from pollution and not the ecological health of the stream. The SSRS score ranges from 0-11.2.

Table 2.2: SSRS Categories

SSRS Range	Category
<6.5	Stream at Risk (AR)
>6.5-7.25	Indeterminate/Stream may be at risk
>7.25	Probably not at risk (PNAR)

3. Results

Based on the SSR score both the upstream and downstream stations were categorised as 'Stream at risk' of not meeting Good status, although the upstream station received a higher score. The stream substrate was the same at both stations with a mix of cobbles and gravel. The velocity was fast at the downstream station with areas of riffle and glide. Both stations had riffle and glide habitats. Significant levels of calcification were present on the substrate at both upstream and downstream stations. This is likely due to eutrophication

Table 3.1: Taxa list and relative abundance scores

Taxa	Upstream	Downstream
Emphemeroptera		
Ecdyonurus	1	
Ephemerellidae	1	1
Trichoptera		
Hydropsychidae	1	
Rhyacophilidae	1	
Limnephilidae	2	
Sericostomatidae	2	
Goeridae	1	
Odontoceridae	2	
Glossosomatidae		1
G.Ol.D		
Potamopyrgus	1	
Chironomidae	1	1
Tipulidae	1	
Naididae	1	
Pediciidae	1	
Simuliidae		1
Asellus	Absent	Absent

Table 3.2: Biological sampling results

Station	SSRS Score	SSRS Category
Castledermot Upstream	6.4	Stream at Risk (AR)
Castledermot Downstream	5.6	Stream at Risk (AR)

4. Castledermot WWTP Comparison 2016 to 2024

Table 4.1 compares the SSRS results from 2016 to 2023 and Figure 4.1 displays the trend over time. Both upstream and downstream stations have been 'at risk' since 2016 with the exception of 2017 and 2020 when upstream was 'Indeterminate stream may be at risk'

Table 4.1: Castledermot SSRS Comparison 2016-2024

Year	U/S SSRS	U/S Risk Category	D/S SSRS	D/S Risk Category
2024	6.4	AR	5.6	AR
2023	4.0	AR	5.6	AR
2022	4.8	AR	4.0	AR
2021	4.8	AR	6.4	AR
2020	7.2	Indet.	4.0	AR
2019	6.4	AR	5.6	AR
2018	5.6	AR	6.4	AR
2017	7.2	Indet.	4.8	AR
2016	3.2	AR	4	AR

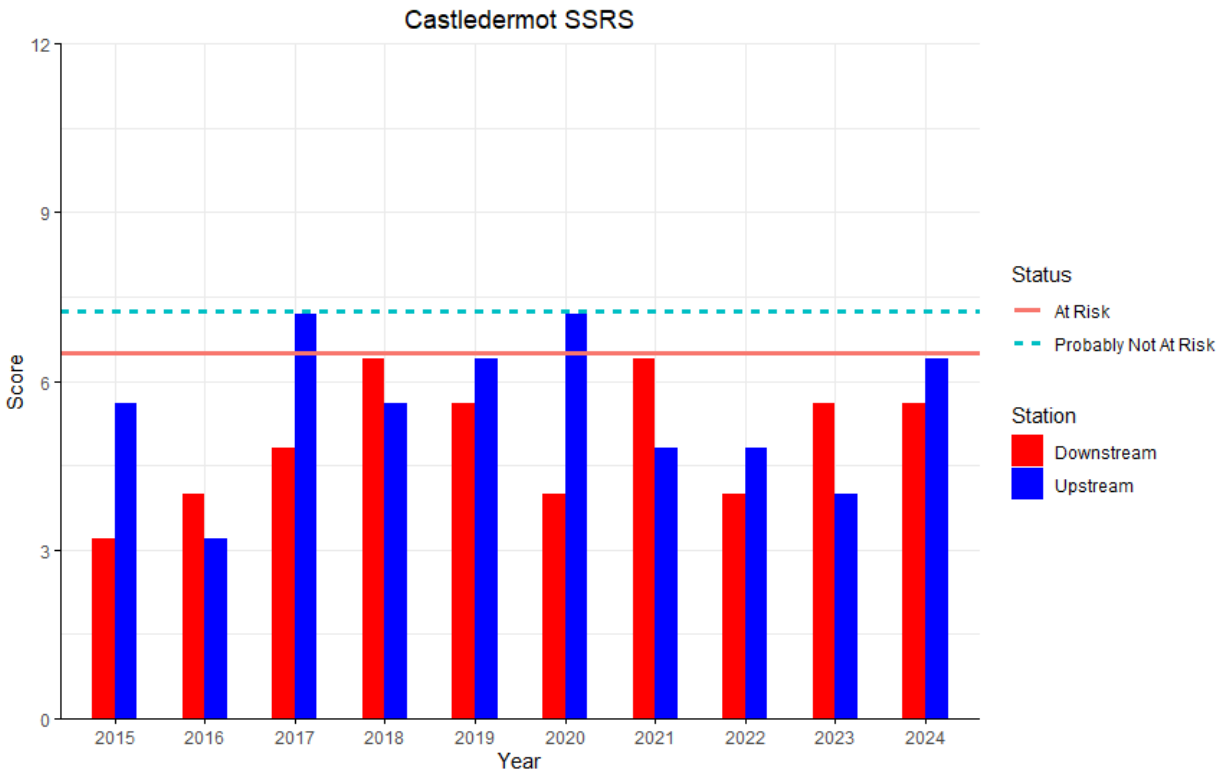


Figure 4-1: SSRS comparison for Upstream and Downstream sites since 2015

5. References

EPA. 2015. Guidance on Application and Use of the SSRS in Enforcement of Urban Waste Water Discharge Authorisations in Ireland. https://www.epa.ie/publications/compliance--enforcement/waste-water/SSRS-in-Enforcement-of-UWWDAs.pdf Accessed September 2021.

Lucey, J., Bowman, J.J., Klabby, K.J., Cunningham, P., Lehane, M., MacCarthaigh, M., McGarrigle, M.L. and Toner, P.F. 1999. Water Quality in Ireland, 1995 – 1997. EPA.

Appendix 1 – Site photos

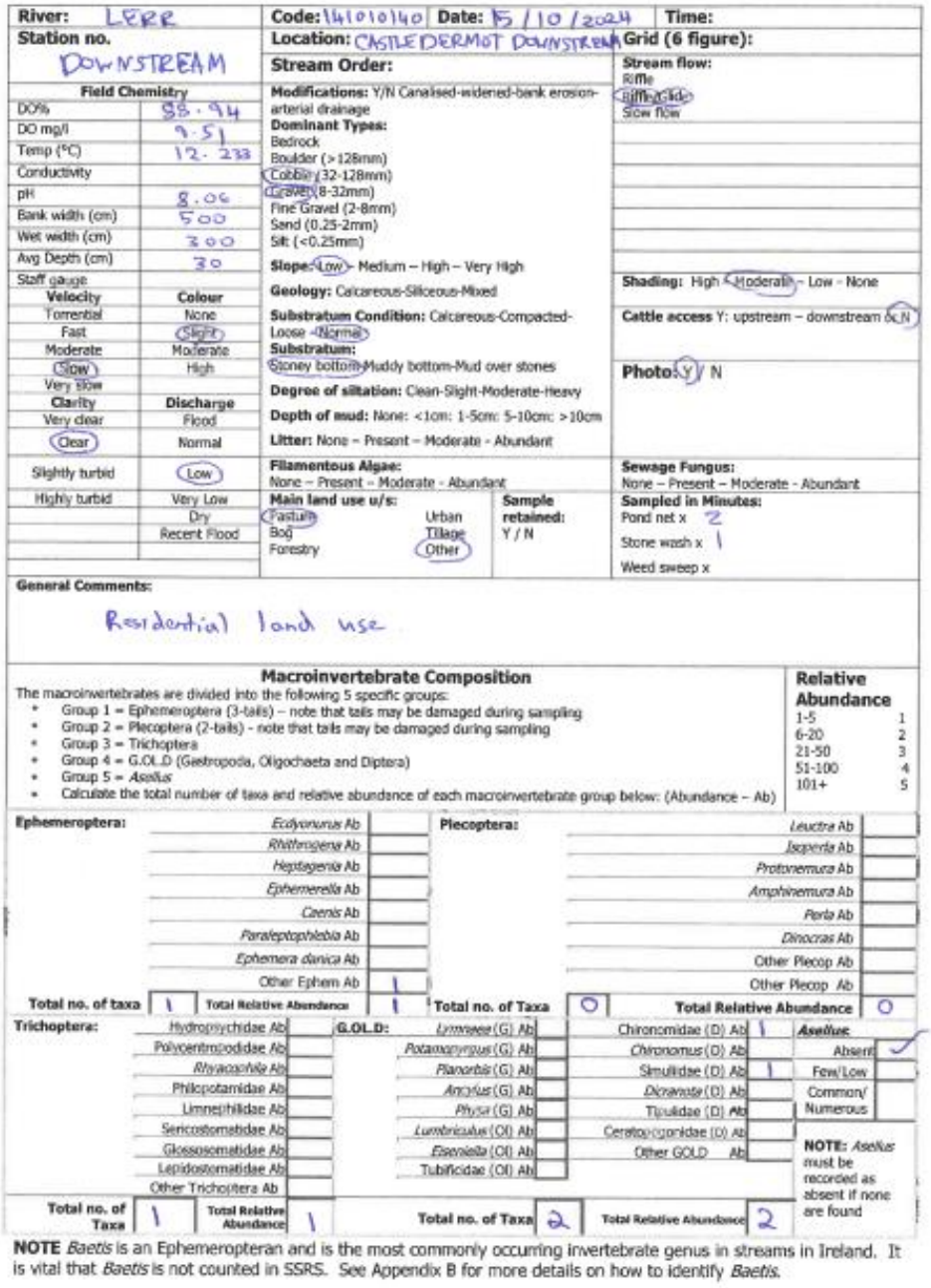
Castledermot Downstream looking downstream

Castledermot Downstream looking upstream

Castledermot Upstream looking downstream

..Castledermot Upstream looking upstream

Appendix 2 – SSRS Data Sheets



River: LERR	**Code:** 14010140	**Date:** 15/10/2024	**Time:**
Station no. DOWNSTREAM	**Location:** CASTLEDERMOT DOWNSTREAM		**Grid (6 figure):**
	Stream Order:		**Stream flow:** Riffle; Riffle-Glide; Slow flow

Field Chemistry

DO%	88.94
DO mg/l	9.51
Temp (°C)	12.233
Conductivity	
pH	8.06
Bank width (cm)	500
Wet width (cm)	300
Avg Depth (cm)	30
Staff gauge	

Velocity	Colour
Torrential	None
Fast	(Slight)
Moderate	Moderate
(Slow)	High
Very slow	
Clarity	**Discharge**
Very clear	Flood
(Clear)	Normal
Slightly turbid	(Low)
Highly turbid	Very Low
	Dry
	Recent Flood

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

Dominant Types:
Bedrock
Boulder (>128mm)
Cobble (32-128mm)
(Gravel) (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

Slope: (Low) – Medium – High – Very High

Geology: Calcareous-Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-Loose-(Normal)

Substratum: (Stoney bottom)-Muddy bottom-Mud over stones

Degree of siltation: Clean-Slight-Moderate-Heavy

Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm

Litter: None – Present – Moderate - Abundant

Shading: High - (Moderate) - Low - None

Cattle access Y: upstream – downstream & (N)

Photo: (Y) / N

Filamentous Algae: None – Present – Moderate - Abundant

Sewage Fungus: None – Present – Moderate - Abundant

Main land use u/s: (Pasture) Urban; Bog Tillage; Forestry (Other)

Sample retained: Y / N

Sampled in Minutes: Pond net x 2; Stone wash x 1; Weed sweep x

General Comments: Residential land use

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:
- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

Relative Abundance

1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab	1	Other Plecop Ab	
Total no. of taxa	1	**Total Relative Abundance** 1	**Total no. of Taxa** 0	**Total Relative Abundance** 0

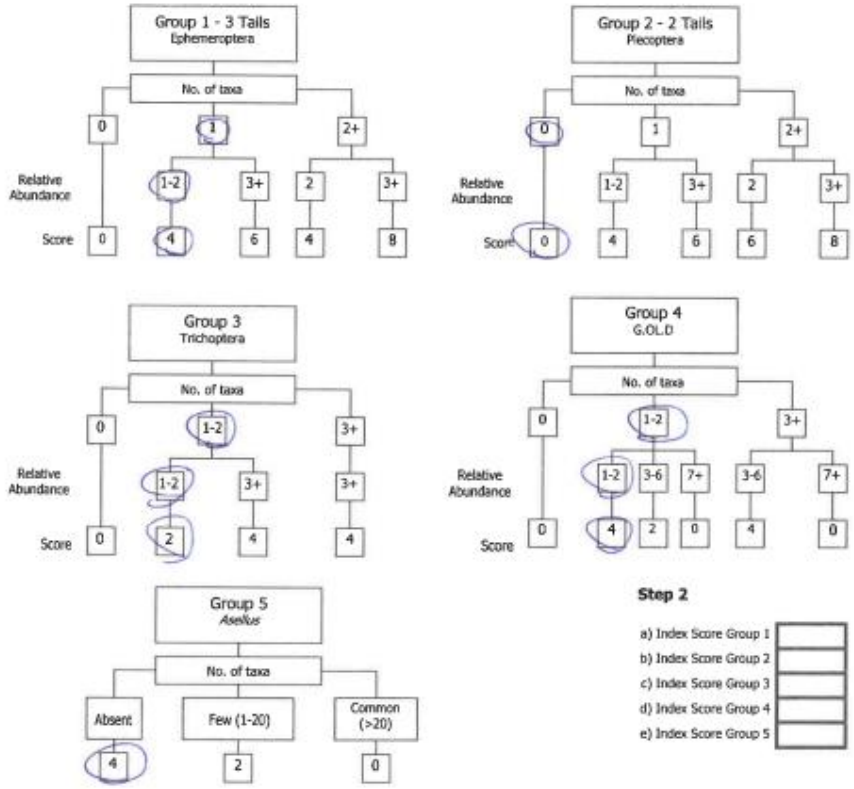
Trichoptera:		**G.OL.D:**				**Asellus**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab	1	Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab	1	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa 1	**Total Relative Abundance** 1	**Total no. of Taxa** 2	**Total Relative Abundance** 2				

NOTE: *Asellus* must be recorded as absent if none are found

NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

Downstream

Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.



Step 2

a) Index Score Group 1	
b) Index Score Group 2	
c) Index Score Group 3	
d) Index Score Group 4	
e) Index Score Group 5	

Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	Average Index Score (AIS) TIS/5 (5 for 5 groups)	**SSR Score** (AIS x 2)
14	2.8	5.6

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk	> 6.5 – 7.25 Indeterminate Stream may be at risk	<6.5 Stream at risk
		✓

Surveyor (signed): Dunleavy Name (print): DANIEL DUNLEAVY Date: 01 / 11 / 2024

Downstream II

River: LERR	**Code:** 14C010120	**Date:** 18/10/2024	**Time:**
Station no. UPSTREAM	**Location:** CASTLEDERMOT ASWI-PN		**Grid (6 figure):** 277669, 181624
	Stream Order:		**Stream flow:** Riffle; Riffle/Glide; Slow flow

Field Chemistry	
DO%	85.76
DO mg/l	9.22
Temp (°C)	12.00
Conductivity	
pH	8.05
Bank width (cm)	700
Wet width (cm)	500
Avg Depth (cm)	30
Staff gauge	

Velocity	Colour
Torrential	None
Fast	Slight
Moderate	Moderate
Slow	High
Very slow	

Clarity	Discharge
Very clear	Flood
Clear	Normal
Slightly turbid	Low
Highly turbid	Very Low
	Dry
	Recent Flood

Modifications: Y/N Canalised-widened-bank erosion-arterial drainage

Dominant Types:
Bedrock
Boulder (>128mm)
Cobble (32-128mm)
Gravel (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

Slope: Low – Medium – High – Very High

Geology: Calcareous-Siliceous-Mixed

Substratum Condition: Calcareous-Compacted-Loose - Normal

Substratum: Stoney bottom-Muddy bottom-Mud over stones

Degree of siltation: Clear-Slight-Moderate-Heavy

Depth of mud: None-<1cm: 1-5cm: 5-10cm: >10cm

Litter: None – Present – Moderate - Abundant

Filamentous Algae: None – Present – Moderate - Abundant

Main land use u/s: Pasture; Urban; Bog; Tillage; Forestry; Other

Sample retained: Y N

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Sewage Fungus: None – Present – Moderate - Abundant

Sampled in Minutes:
Pond net x 2
Stone wash x 1
Weed sweep x

General Comments:

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:

- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab	1	*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab		*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab (Ephemerellidae)	1	Other Plecop Ab	
Total no. of taxa	2	**Total no. of Taxa**	0
Total Relative Abundance	2	**Total Relative Abundance**	0

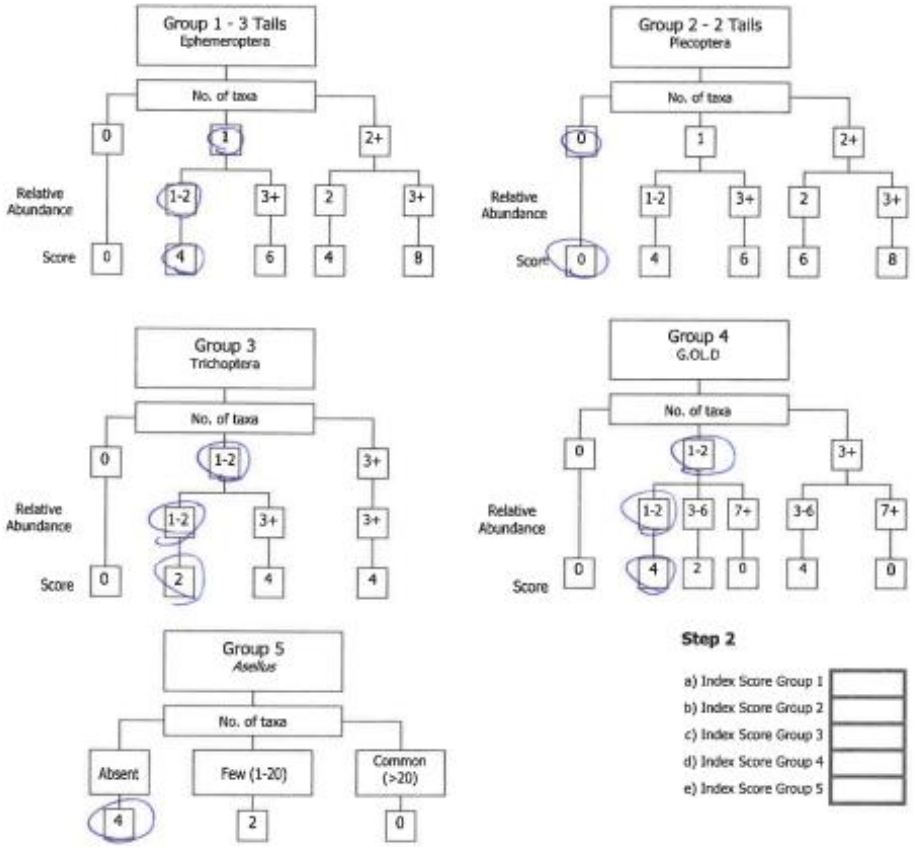
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab	1	*Limnaea* (G) Ab		Chironomidae (D) Ab	1	Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab	1	*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab	1	*Planorbis* (G) Ab		Simuliidae (D) Ab		Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab	2	*Physa* (G) Ab		Tipulidae (D) Ab	1		
Sericostomatidae Ab	2	*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab (Goeridae 1)		*Eiseniella* (Ol) Ab		Other GOLD Ab	2		
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab (Odontoceridae 2)	3	Pediciidae 1		Naididae 1			
Total no. of Taxa	6	**Total Relative Abundance**	9	**Total no. of Taxa**	5	**Total Relative Abundance**	5

NOTE: *Asellus* must be recorded as absent if none are found

NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

Upstream

Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.



Step 3. Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

Total Index Score (TIS) sum (a+b+c+d+e)	Average Index Score (AIS) TIS/5 (5 for 5 groups)	SSR Score (AIS x 2)
14	2.8	5.6

Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk	> 6.5 – 7.25 Indeterminate Stream may be at risk	<6.5 Stream at risk
		✓

Surveyor (signed): Dónal Dunleavy Name (print): DANIEL DUNLEAVY Date: 01 / 11 / 2024

Upstream II