

Annual Environmental Report

2022



Derrintum

D0244-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2022 AER

This Annual Environmental Report has been prepared for D0244-01, Derrinturn, 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 improvements undertaken in 2022.

1.2 TREATMENT SUMMARY

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

- Derrinturn WWTP with a Plant Capacity PE of 1600, 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
TPEFF1400D0244SW001	Derrinturn 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 DERRINTURN WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - DERRINTURN 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
COD-Cr mg/l	10	1001	419
pH pH units	10	7.37	7.20
Ammonia-Total (as N) mg/l	10	59	30
BOD, 5 days with Inhibition (Carbonaceous) mg/l	10	290	146
ortho-Phosphate (as P) - unspecified mg/l	10	4.95	2.85
Total Nitrogen mg/l	10	71	41
Total Phosphorus (as P) mg/l	10	11	5.28
Suspended Solids mg/l	10	460	197
Hydraulic Capacity	N/A	986	651

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 2.1.5 if applicable.

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional 'Operational Performance Summary'. 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 - TPEFF1400D0244SW001

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	125	N/A	12	N/A	N/A	20	Pass
Total Nitrogen mg/l	35	88	N/A	12	N/A	N/A	5.66	Pass
pH pH units	6.00	9.00	N/A	12	N/A	N/A	7.05	Pass
Suspended Solids mg/l	8.00	8.00	N/A	12	N/A	N/A	2.03	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	5.00	5.00	N/A	12	N/A	N/A	1.72	Pass
Total Phosphorus (as P) mg/l	0.500	0.500	N/A	12	N/A	N/A	0.290	Pass
Ammonia-Total (as N) mg/l	0.300	0.360	N/A	12	N/A	N/A	0.157	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)
ortho-Phosphate (as P) - unspecified mg/l	0.190	0.220	N/A	12	N/A	N/A	0.117	Pass
Conductivity @20°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	852	

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 TPEFF1400D0244SW001

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	273020, 231285	RS14F010020	No	No	No	No	Poor
Downstream	269666, 230148	RS14F010050	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 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.

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 - DERRINTURN WWTP

2.1.4.1 Treatment Efficiency Report - Derrinturn 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	34853	357	99
TN	9759	1171	88
TP	1256	60	95
SS	46977	420	99
COD	99790	4194	96

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

2.1.4.2 Treatment Capacity Report Summary - Derrinturn 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.

Derrinturn WWTP	
Peak Hydraulic Capacity (m³/day) - As Constructed	1080
DWF to the Treatment Plant (m³/day)	360
Current Hydraulic Loading - annual max (m³/day)	986

Derrinturn WWTP	
Average Hydraulic loading to the Treatment Plant (m ³ /day)	650.9
Organic Capacity (PE) - As Constructed	1600
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	1755
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 - DERRINTURN 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 2022.			

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	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2022	4
Number of Incidents reported to the EPA via EDEN in 2022	4
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 2022 (No. of events)	Total volume discharged in 2022 (m ³)	Monitoring Status
SW-2	270591, 232157	Yes	Low Significance	Meeting Criteria	0	0	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 monitored SWOs in the agglomeration in the year (m ³)?	0
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
There are no Specified Improvement Programmes for this Agglomeration.							

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	2018	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	Yes
List reason e.g. changes to monitoring requirements	Ambient Monitoring Location Changes
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:

Date: 22/02/2023

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

Acting Head of Environmental Regulation.

Derrinturn Ambient Monitoring Summary 2022

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)				Current WFD Status	Mean (mg/l)		
			Bathing Water	Drinking Water	FWPM	Shellfish		cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	273020, 231285	RS14F010020	No	No	No	No	Poor	1.333	0.089	0.511
Downstream Monitoring Point	269666, 230148	RS14F010050	No	No	No	No	Poor	1.300	0.081	0.394
<i>Difference</i>								-0.033	-0.008	-0.117
EQS								1.500	0.035	0.065
% of EQS								-2.222%	-22.540%	-180.171%

Derrinturn Ambient Monitoring Summary 2022

Upstream Results											
Date		Temperature oC	pH pH units	BOD mg/ l	COD mg/l	Suspended solids mg/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Ammonia mg/l	Ortho- Phosphate mg/l	DO mg/l
17/02/2022	U/S		7.12	1	42	1	5.35	0.36	0.81	0.12	7.98
08/03/2022	U/S		7.84	1	31	3	2.81	0.1	0.81	0.06	8.97
19/04/2022	U/S	14.4	7.28	1	43	4	1.75	0.1	0.47	0.04	8.48
10/05/2022	U/S	15.9	7.61	1	30	2	1.9	0.23	0.41	0.12	7.37
21/06/2022	U/S	17.4	7.61	1	30	1	1	0.197	0.39	0.05	7.01
15/07/2022	U/S	19.2	7.66	1	26	1	1.1	0.186	0.36	0.06	8.05
06/09/2022	U/S	17.5	6.8	2	11	1	3.04	0.207	0.2	0.17	8.08
19/10/2022	U/S	15.9	7.61	2	44	1	3.29	0.12	0.47	0.11	9.32
17/11/2022	U/S	12.8	7.45	2	54	1	3.85	0.078	0.68	0.07	9.91
Mean		16.157	7.442	1.333	34.556	1.667	2.677	0.175	0.511	0.089	8.352
95%ile		18.690	7.768	2.000	50.000	3.600	4.750	0.308	0.810	0.150	9.674

Downstream Results											
		Temperature oC	pH pH units	BOD mg/ l	COD mg/l	Suspended solids mg/l	Total Nitrogen mg/l	Total Phosphorus mg/l	Ammonia mg/l	Ortho- Phosphate mg/l	DO mg/l
17/02/2022	D/S		7.16	1	37	1	5.62	0.34	0.79	0.08	8.44
08/03/2022	D/S		7.63	1	22	4	4.39	0.11	0.47	0.08	8.91
19/04/2022	D/S	14.3	7.27	1	30	2	3.53	0.14	0.35	0.07	8.91
10/05/2022	D/S	15.1	7.73	2	28	2	1.7	0.21	0.4	0.12	7.75
21/06/2022	D/S	17.3	7.64	1	18	1	0.96	0.183	0.26	0.04	7.03
15/07/2022	D/S	18.8	7.72	1	21	1	1	0.173	0.29	0.05	8.49
15/08/2022	D/S	20	7.15	1	17	2	5.26	0.233	0.22	0.09	7
06/09/2022	D/S	17.5	6.86	1	12	1	3.02	0.186	0.18	0.15	7.66
19/10/2022	D/S	16.2	7.57	3	42	1	3.19	0.079	0.46	0.07	9.13
17/11/2022	D/S	12.7	7.38	1	47	1	3.8	0.071	0.52	0.06	9.73
Mean		16.488	7.411	1.300	27.400	1.600	3.247	0.173	0.394	0.081	8.305
95%ile		19.580	7.726	2.550	44.750	3.100	5.458	0.292	0.669	0.137	9.460

Note: Where the concentration in the result is less than the limit of detection (LOD), a value of LOD/sqrt(2) was used in calculating the mean and 95%ile concentrations.



Derrinturn Small Stream Risk Score 2022

Produced by

AQUAFACT International Services Ltd

For

Kildare County Council

November 2022

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Report Approval Sheet

Client	Kildare County Council
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Job Number	JN1741
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Rev	Status	Issue Date	Document File Name	Author (s)	Approved by:
1	Draft	30/11/2022	JN1741 Derrinturn SSRS 2022	Aaron Skehan	E. McCormack
2	Final	05/12/2022	JN1741 Derrinturn SSRS 2022 Final	Aaron Skehan	E. McCormack



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Appendices

Appendix 1: Photo log

Appendix 2: SSRS Data Sheets

1. Introduction

AQUAFAC was contracted by Kildare County Council to carry out an SSRS assessment of the discharge belonging to Derrinturn wastewater treatment plants. A sample was taken upstream and downstream of the discharge point. The sampling was carried out on the 25th of October 2022.

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. Net sweepings of any submerged marginal plants were also conducted. The kick 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 returned to the lab, preserved in 70% industrial methylated spirits, identified and enumerated. 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: Derrinturn SSRS sampling sites.

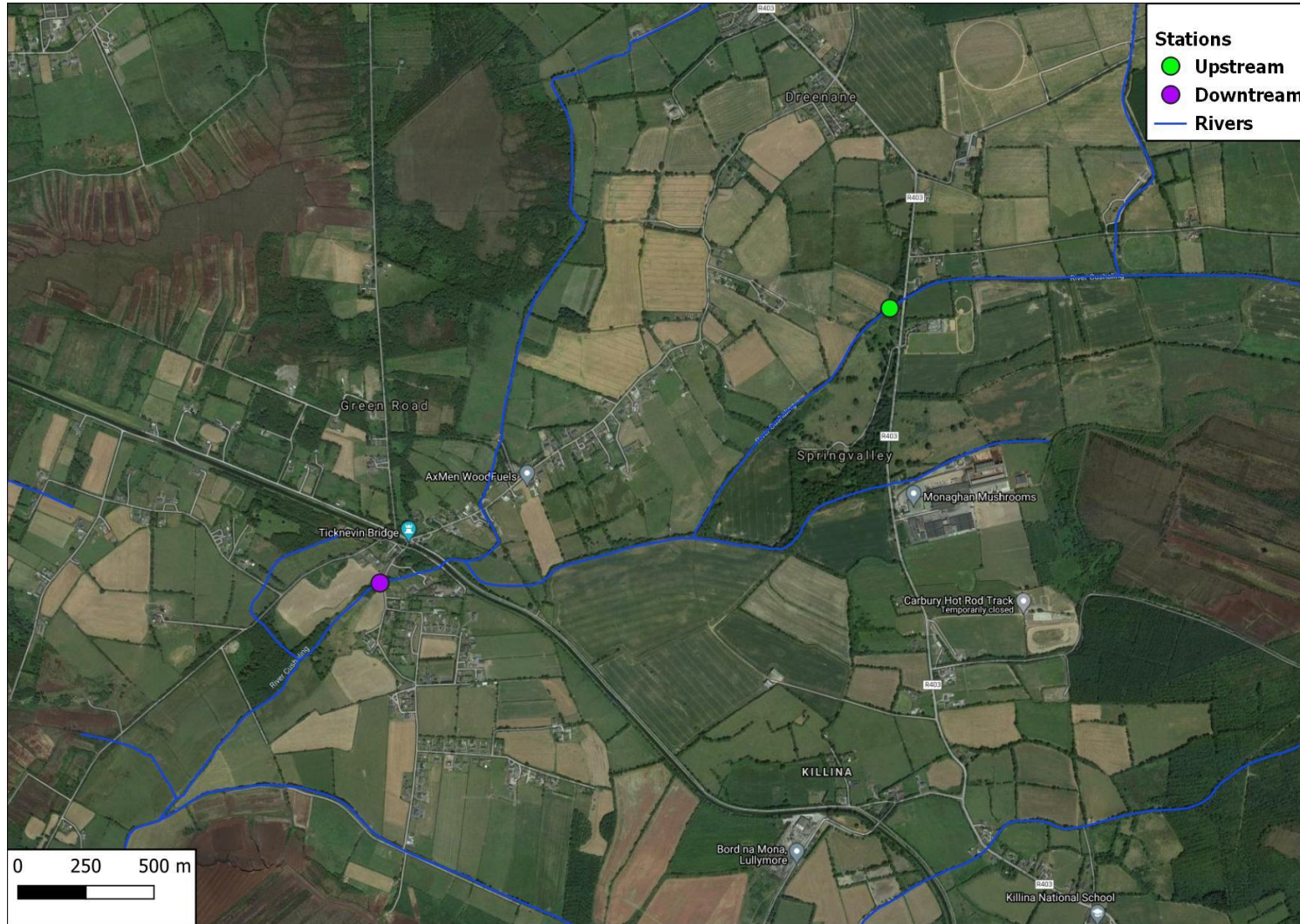


Table 2.1: Derrinturn SSRS station coordinates.

Station	Easting	Northing
Derrinturn aSW1-PU	271514	231178
Derrinturn aSW1-PD	269657	230144

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 or not the stream is at risk from pollution and is not a measurement of 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
>6.5-7.25	Indeterminate stream may be at risk
>7.25	Probably not at risk

3. Results

Table 3.1 presents a list of the taxa recorded in each sample and their relative abundance and Table 3.2 presents the SSRS. The full SSRS data sheets and scoring are presented in Appendix 2. The upstream station recorded a slightly lower SSR score compared to the downstream station. However, both the upstream and downstream stations were categorised as 'Stream at risk' of not meeting Good status. The substrate at the upstream station was mud with a depth of approximately 5-10cm. Leaf litter was abundant, and the velocity of the stream was slow. The downstream station substrate was a mix of cobbles and gravel with some slight siltation. The velocity was moderate. There was cattle access both above and below the

downstream station. The downstream station recorded the oligochaete *Lumbriculus* and the trichopteran Limnephilidae, which were not recorded upstream. Chironimidae were highly abundant upstream (>100) but absent downstream.

Table 3.1: SSRS relative abundance of taxa

Taxa	Upstream	Downstream
Trichoptera		
Limnephilidae		2
Oligochaeta		
<i>Lumbriculus</i>		2
Diptera		
Chironomidae	5	

Table 3.2: Biological sampling results.

Station	SSRS score	SSRS category
Derrinturn aSW1-PU	0.8	Stream at risk
Derrinturn aSW1-PD	1.6	Stream at risk

4. Derrinturn WWTP comparison 2015 to 2022

Table 4.1 compares the SSRS results from 2015 to 2022. Figure 4.1 displays the trend over time (scores <6.5 are deemed At Risk). Both upstream and downstream sites have been 'at risk' since 2015. The highest SSR score in that period was 3.2 both upstream and downstream. The SSRS score was higher upstream in 2016, 2017, 2019 and 2021. It was higher downstream in 2018, 2020 and 2022. Both sites were the same in 2015. A tributary joins the stream from the east between the upstream and downstream stations, it is not known if any contamination enters the stream from this point. Just upstream of the downstream station the stream is culverted under the Grand Canal which could be impacting on water quality.

Table 4.1: Derrinturn WWTP- SSRS Comparison 2015 -2022

Site	SSRS								SSRS Risk Category							
	2015	2016	2017	2018	2019	2020	2021	2022	2015	2016	2017	2018	2019	2020	2021	2022
U/S	0.8	3.2	3.2	1.6	3.2	1.6	2.4	0.8	AR	AR	AR	AR	AR	AR	AR	AR
D/S	0.8	2.4	1.6	2.4	1.6	3.2	0.8	1.6	AR	AR	AR	AR	AR	AR	AR	AR

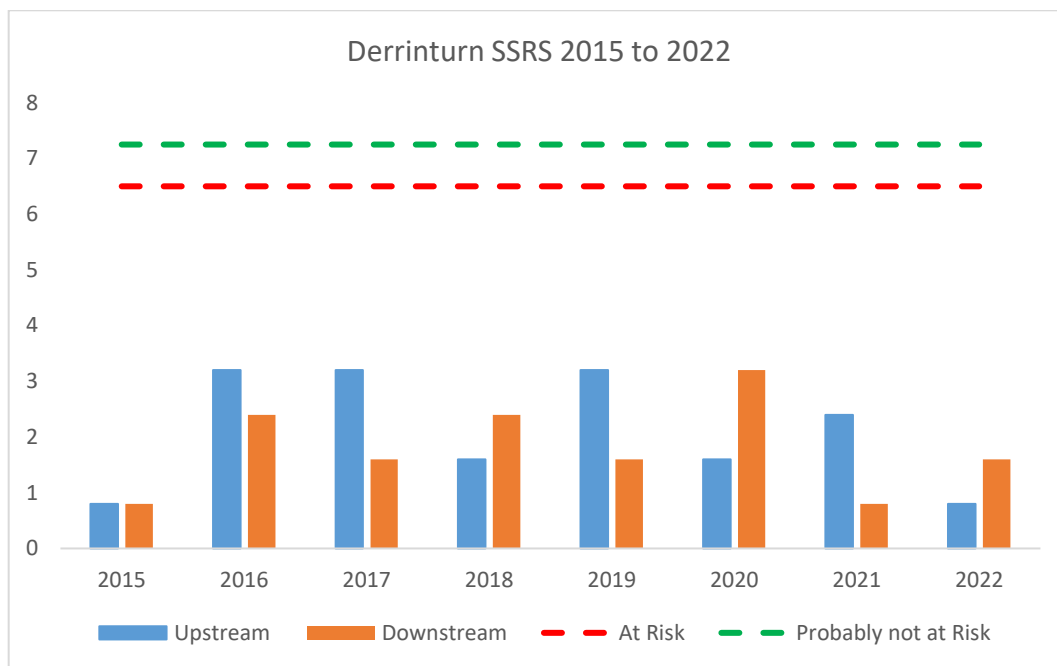


Figure 4.1: Derrinturn WWTP SSRS scores 2015 to 2022

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

Photo log



Derrinturn upstream



Derrinturn downstream

Appendix 2

SSRS Data Sheets



DERRINTURN UPSTREAM

River: FIGILE	Code:	Date: 25-10-22	Time: 12.06
Station no. UPSTREAM	Location:	Grid (6 figure):	
Field Chemistry		Stream Order:	Stream flow: Riffle Riffle/Glide <u>Slow flow</u>
DO%		Modifications: Y/N Canalised-widened-bank erosion-arterial drainage	
DO mg/l		Dominant Types: Bedrock	
Temp (°C)		Boulder (>128mm)	
Conductivity		Cobble (32-128mm)	
pH		Gravel (8-32mm)	
Bank width (cm)	2	Fine Gravel (2-8mm)	
Wet width (cm)	2	Sand (0.25-2mm)	
Avg Depth (cm)		Silt (<0.25mm)	
Staff gauge		Slope: <u>Low</u> - Medium - High - Very High	Shading: High - Moderate - Low - None
Velocity	Colour	Geology: Calcareous-Siliceous-Mixed	Cattle access: Y: <u>upstream</u> - downstream or N
Torrential	None	Substratum Condition: Calcareous-Compacted-Loose - <u>(Normal)</u>	Photo: <u>Y</u> / N
Fast	Slight	Substratum: Stoney bottom - <u>(Muddy bottom)</u> - Mud over stones	
Moderate	Moderate	Degree of siltation: Clean-Slight-Moderate-Heavy	
<u>Slow</u>	<u>(High)</u>	Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm	
Very slow		Litter: None - <u>(Present)</u> - Moderate - Abundant	
Clarity	Discharge	Filamentous Algae: None - Present - Moderate - Abundant	Sewage Fungus: None - Present - Moderate - Abundant
Very clear	Flood	Main land use u/s: <u>(Pasture)</u> Urban Bog Tillage Forestry Other	Sample retained: Y / N
Clear	<u>(Normal)</u>		Sampled in Minutes: Pond net x Stone wash x Weed sweep x
<u>(Slightly turbid)</u>	Low		
Highly turbid	Very Low		
	Dry		
	Recent Flood		

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.O.L.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

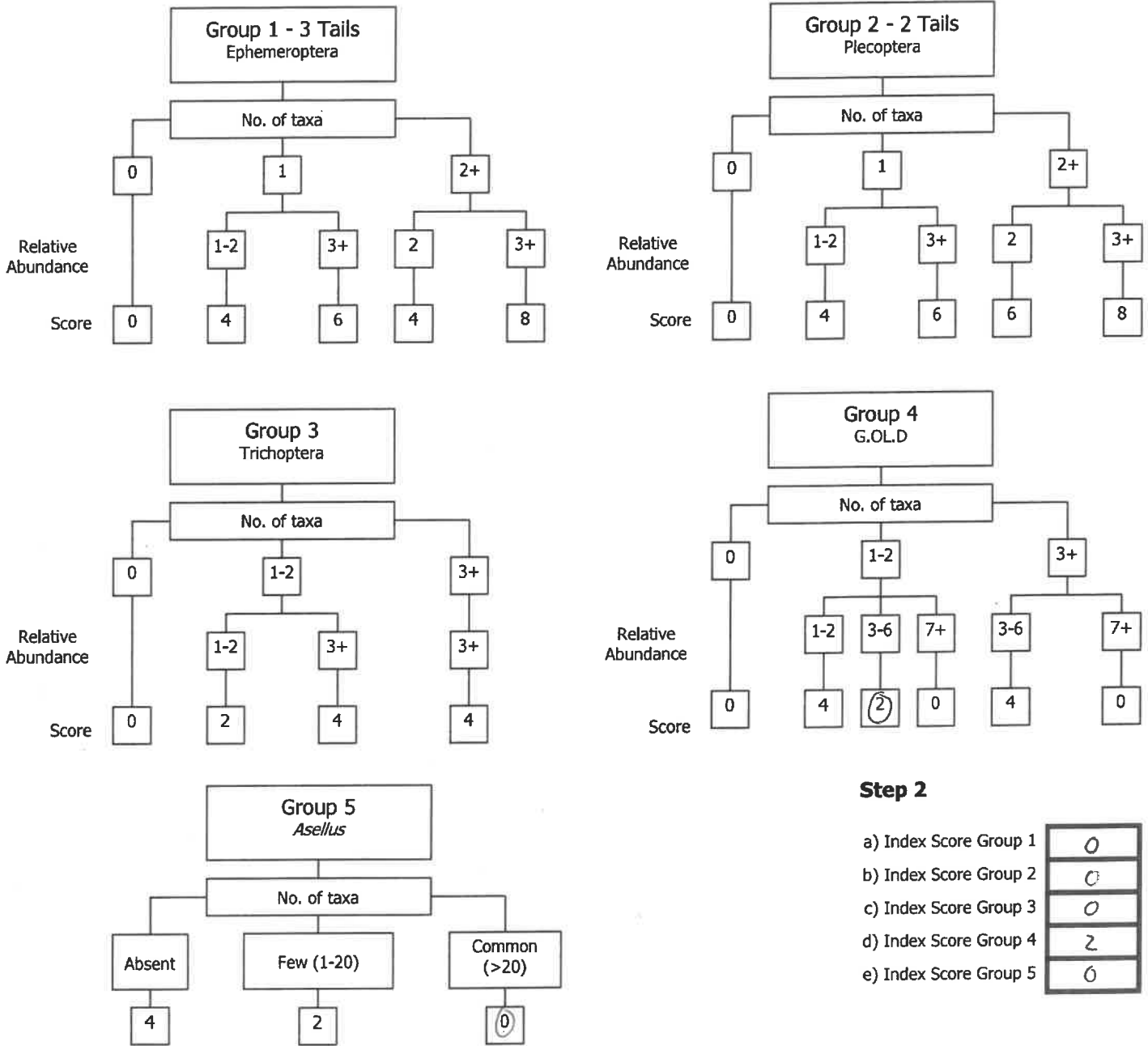
Ephemeroptera:		Plecoptera:	
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab	
<i>Rhithrogena</i> Ab		<i>Isoperla</i> Ab	
<i>Heptagenia</i> Ab		<i>Protonemura</i> Ab	
<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab	
<i>Caenis</i> Ab		<i>Pera</i> Ab	
<i>Paraleptophlebia</i> Ab		<i>Dinocras</i> Ab	
<i>Ephemera danica</i> Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	Total Relative Abundance	Total no. of Taxa	Total Relative Abundance
Trichoptera:	G.O.L.D:	Chironomidae (D) Ab	Asellus:
Hydropsychidae Ab	<i>Lymnaea</i> (G) Ab	113	Absent
Polycentropodidae Ab	<i>Potamopyrgus</i> (G) Ab	<i>Chironomus</i> (D) Ab	Few/Low
<i>Rhyacophila</i> Ab	<i>Planorbis</i> (G) Ab	Simuliidae (D) Ab	Common/ Numerous <input checked="" type="checkbox"/>
Philopotamidae Ab	<i>Ancyclus</i> (G) Ab	<i>Dicranota</i> (D) Ab	
Limnephilidae Ab	<i>Physa</i> (G) Ab	Tipulidae (D) Ab	
Sericostomatidae Ab	<i>Lumbriculus</i> (OI) Ab	Ceratopogonidae (D) Ab	
Glossosomatidae Ab	<i>Eiseniella</i> (OI) Ab	Other GOLD Ab	
Lepidostomatidae Ab	Tubificidae (OI) Ab		
Other Trichoptera Ab			
Total no. of Taxa	Total no. of Taxa	Total Relative Abundance	NOTE: Asellus must be recorded as absent if none are found
	1	5	

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*.

At Risk

DERRINTURN 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 2

a) Index Score Group 1	0
b) Index Score Group 2	0
c) Index Score Group 3	0
d) Index Score Group 4	2
e) Index Score Group 5	0

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) 2

Average Index Score (AIS) TIS/5 (5 for 5 groups) 0.4

SSR Score (AIS x 2) 0.8

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): Aaron Skehan Name (print): AARON SKEHAN Date: 25 / 10 / 22

River: FIGILE	Code:	Date: 25-10-22	Time: 11:45
Station no. DOWNSTREAM	Location: PERRINTURN	Grid (6 figure):	
Field Chemistry		Stream Order:	Stream flow: Riffle <u>Riffle/Glide</u> Slow flow
DO%		Modifications: Y/N Canalised-widened-bank erosion- arterial drainage	
DO mg/l		Dominant Types: Bedrock	
Temp (°C)		Boulder (>128mm)	
Conductivity		Cobble (32-128mm)	
pH		Gravel (8-32mm)	
Bank width (cm)		Fine Gravel (2-8mm)	
Wet width (cm)		Sand (0.25-2mm)	
Avg Depth (cm)		Silt (<0.25mm)	
Staff gauge		Slope: <u>Low</u> - Medium - High - Very High	Shading: High - <u>Moderate</u> - Low - None
Velocity	Colour	Geology: Calcareous-Siliceous-Mixed	Cattle access: Y: <u>upstream</u> - downstream or N
Torrential	None	Substratum Condition: Calcareous-Compacted- Loose - <u>Normal</u>	Photo: <u>Y</u> / N
Fast	Slight	Substratum: Stoney bottom-Muddy bottom- <u>Mud over stones</u>	
<u>Moderate</u>	<u>Moderate</u>	Degree of siltation: Clean - <u>Slight</u> - Moderate - Heavy	
Slow	High	Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm	
Very slow		Litter: None - Present - Moderate - Abundant	
Clarity	Discharge	Filamentous Algae: None - Present - Moderate - Abundant	Sewage Fungus: None - Present - Moderate - Abundant
Very dear	Flood	Main land use u/s: <u>Pasture</u> Urban Bog Tillage Forestry Other	Sample retained: <u>Y</u> N
<u>Clear</u>	<u>Normal</u>		Sampled in Minutes: Pond net x Stone wash x Weed sweep x
Slightly turbid	Low		
Highly turbid	Very Low		
	Dry		
	Recent Flood		

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.O.L.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

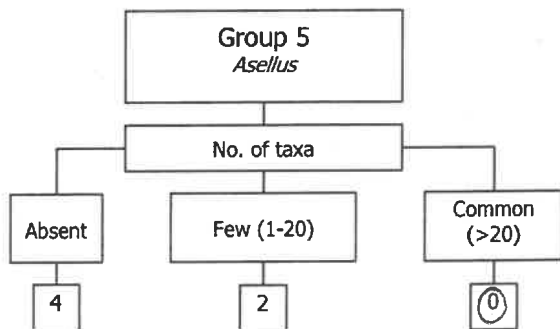
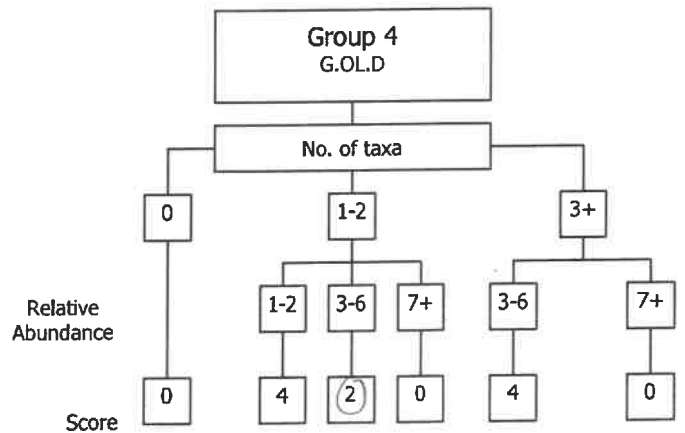
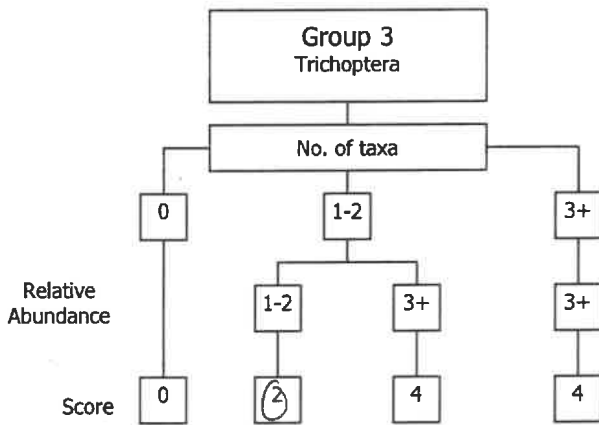
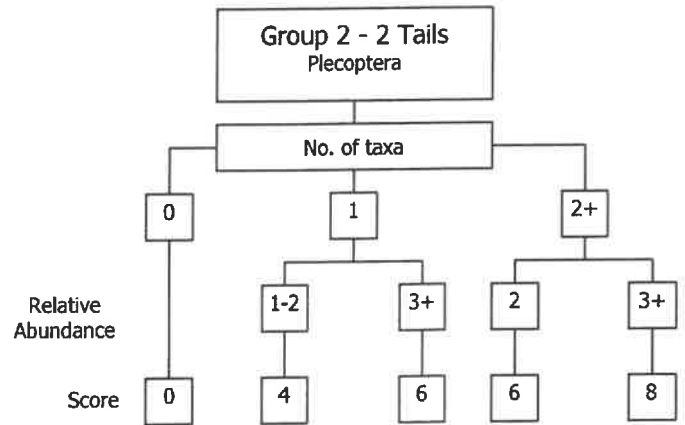
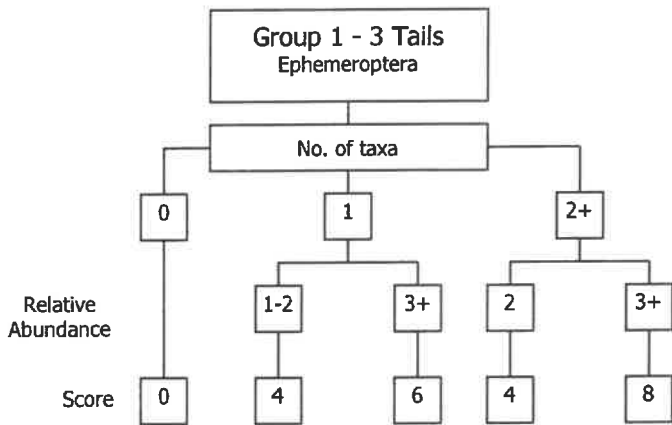
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:	<i>Ecdyonurus</i> Ab		Plecoptera:	<i>Leuctra</i> Ab	
	<i>Rhithrogena</i> Ab			<i>Isoperla</i> Ab	
	<i>Heptagenia</i> Ab			<i>Protonemura</i> Ab	
	<i>Ephemerella</i> Ab			<i>Amphinemura</i> Ab	
	<i>Caenis</i> Ab			<i>Perla</i> Ab	
	<i>Paraleptophlebia</i> Ab			<i>Dinocras</i> Ab	
	<i>Ephemera danica</i> Ab			Other Plecop Ab	
	Other Ephem Ab			Other Plecop Ab	
Total no. of taxa	Total Relative Abundance		Total no. of Taxa	Total Relative Abundance	
Trichoptera:	Hydropsychidae Ab		G.O.L.D:	<i>Lymnaea</i> (G) Ab	5
	Polycentropodidae Ab			<i>Potamopyrgus</i> (G) Ab	
	<i>Rhyacophila</i> Ab			<i>Planorbis</i> (G) Ab	
	Philopotamidae Ab			<i>Ancyclus</i> (G) Ab	
	Limnephilidae Ab	10		<i>Physa</i> (G) Ab	
	Sericostomatidae Ab			<i>Lumbriculus</i> (Ol) Ab	10
	Glossosomatidae Ab			<i>Eiseniella</i> (Ol) Ab	
	Lepidostomatidae Ab			Tubificidae (Ol) Ab	
	Other Trichoptera Ab				
Total no. of Taxa	Total Relative Abundance	2	Total no. of Taxa	Total Relative Abundance	3
				Asellus:	
				Absent	
				Few/Low	
				Common/ Numerous	✓
				NOTE: <i>Asellus</i> 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*.

DERRINTURN 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	0
b) Index Score Group 2	0
c) Index Score Group 3	2
d) Index Score Group 4	2
e) Index Score Group 5	0

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) 4

Average Index Score (AIS) TIS/5 (5 for 5 groups) 0.8

SSR Score (AIS x 2) 1.6

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): Aaron Skehan Name (print): AARON SKEHAN Date: 25 / 10 / 22

7 APPENDIX

Appendix
Appendix 7.1 - Ambient Monitoring Summary
Appendix 7.2 - Small Stream Risk Score Assessment