

Annual Environmental Report

2023



Inniskeen

D0348-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2023 AER

This Annual Environmental Report has been prepared for D0348-01, Inniskeen, in Monaghan 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)

- Inniskeen WWTP with a Plant Capacity PE of 1800, 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
TPEFF2400D0348SW001	Inniskeen 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 INNISKEEN WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - INNISKEEN 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
Total Phosphorus (as P) mg/l	15	212	25
Suspended Solids mg/l	15	12740	2729
COD-Cr mg/l	15	13170	2956
Total Nitrogen mg/l	15	266	78
BOD, 5 days with Inhibition (Carbonaceo mg/l	15	3012	862
Hydraulic Capacity	N/A	1431	360

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 - TPEFF2400D0348SW001

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	15	N/A	N/A	16	Pass
BOD, 5 days with Inhibition (Carbonaceo mg/l)	10	20	N/A	15	1	N/A	1.35	Pass
Suspended Solids mg/l	10	25	N/A	15	2	N/A	6.12	Pass
pH pH units	9	9	N/A	15	N/A	N/A	7.31	Pass
Total Phosphorus (as P) mg/l	2	2.4	N/A	15	N/A	N/A	0.336	Pass
Ammonia-Total (as N) mg/l	2	2.4	N/A	15	N/A	N/A	0.034	Pass
ortho-Phosphate (as P) - unspecified mg/l	1.5	1.8	N/A	15	N/A	N/A	0.188	Pass
Temperature °C	N/A	N/A	N/A	17	N/A	N/A	11	
E. Coli MPN/100ml	N/A	N/A	N/A	2	N/A	N/A	9620	

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	15	N/A	N/A	15	
Nitrite (as N) mg/l	N/A	N/A	N/A	15	N/A	N/A	0.016	
Faecal coliforms no./100mls	N/A	N/A	N/A	2	N/A	N/A	8175	
Enterococci (Intestinal) cfu/100ml	N/A	N/A	N/A	2	N/A	N/A	1188	
Nitrate (as NO3) mg/l	N/A	N/A	N/A	14	N/A	N/A	13	

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 ELVs set in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF2400D0348SW001

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	293998, 306647	RS06F010650	No	No	No	No	Good
Downstream	293998, 306647	RS06F010670	No	No	No	No	Good

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	RS06F010650	1.18	RS06F010670	1.61	1.50	28.5
Ammonia-Total (as N) mg/l	RS06F010650	0.039	RS06F010670	0.020	0.065	-28.6
ortho-Phosphate (as P) - unspecified mg/l	RS06F010650	0.039	RS06F010670	0.021	0.035	-51.7
True Colour mg/litre Pt Co	RS06F010650	41	RS06F010670	N/A	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
Faecal coliforms no./100mls	RS06F010650	93	RS06F010670	91	N/A	
Temperature °C	RS06F010650	15	RS06F010670	17	N/A	
Dissolved Oxygen % Saturation	RS06F010650	89	RS06F010670	N/A	N/A	
Coliform Bacteria (Total) MPN/100ml	RS06F010650	308	RS06F010670	N/A	N/A	
Total Hardness (as CaCO ₃) mg/l	RS06F010650	94	RS06F010670	N/A	N/A	
Enterococci (Intestinal) cfu/100ml	RS06F010650	26	RS06F010670	18	N/A	
Chloride mg/l	RS06F010650	21	RS06F010670	N/A	N/A	
Dissolved Oxygen mg/l	RS06F010650	9.07	RS06F010670	8.88	N/A	
Alkalinity-total (as CaCO ₃) mg/l	RS06F010650	74	RS06F010670	N/A	N/A	
Total Oxidised Nitrogen (as N) mg/l	RS06F010650	1.02	RS06F010670	N/A	N/A	
pH pH units	RS06F010650	7.94	RS06F010670	7.97	N/A	
Conductivity @25°C µS/cm	RS06F010650	234	RS06F010670	N/A	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
Total Nitrogen mg/l	RS06F010650	1.47	RS06F010670	1.51	N/A	
E. Coli MPN/100ml	RS06F010650	119	RS06F010670	109	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 BOD-5 (Total) mg/l, 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 - INNISKEEN WWTP

2.1.4.1 Treatment Efficiency Report - Inniskeen 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)
TN	8280	1657	80
COD	313824	1717	99
TP	2694	36	99

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
SS	289701	660	100
cBOD	91513	146	100

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

2.1.4.2 Treatment Capacity Report Summary - Inniskeen 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.

Inniskeen WWTP	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	1226
DWF to the Treatment Plant (m ³ /day)	409
Current Hydraulic Loading - annual max (m ³ /day)	1431
Average Hydraulic loading to the Treatment Plant (m ³ /day)	360
Organic Capacity (PE) - As Constructed	1800
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	352
Organic Capacity (PE) - Remaining	1448
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 - INNISKEEN 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 2023.			

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)
There were no reportable incidents in 2023.			

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2023	0
Number of Incidents reported to the EPA via EDEN in 2023	0
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 2023 (No. of events)	Total volume discharged in 2023 (m3)	Monitoring Status
SW-2	293927,306700	Yes	Low Significance	Meeting Criteria	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 wastewater discharge by metered SWOs during the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	No
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	Unknown

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	Included in this AER
D0348-01-Drinking Water Abstraction Point Risk Assessment	Yes	No
D0348-01-Priority Substances Assessment	Yes	No
D0348-01-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	Yes
List reason e.g. changes to monitoring requirements	Ambient Monitoring Location Changes
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: 05/03/2024

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

River: <u>FANE</u>		Code:	Date: <u>25/4/23</u>	Time: <u>14:30</u>
Station no. <u>u/s</u>		Location:		Grid (6 figure):
Field Chemistry		Stream Order:		Stream flow: Riffle <u>Riffle/Glide</u> Slow flow
DO%		Modifications: <u>Y/N</u> Canalised-widened-bank erosion-arterial drainage		
DO mg/l		Dominant Types: Bedrock Boulder (>128mm) Cobble (32-128mm) <u>Gravel (8-32mm)</u> Fine Gravel (2-8mm) Sand (0.25-2mm) Silt (<0.25mm)		
Temp (°C)		Slope: Low - <u>Medium</u> - High - Very High		
Conductivity		Geology: Calcareous-Siliceous- <u>Mixed</u>		Shading: High - <u>Moderate</u> - Low - None
pH		Substratum Condition: Calcareous-Compacted-Loose - Normal		Cattle access Y: upstream - downstream or N
Bank width (cm)		Substratum: <u>Stoney bottom</u> -Muddy bottom-Mud over stones		Photo: <u>Y/N</u>
Wet width (cm)		Degree of siltation: <u>Clean</u> -Slight-Moderate-Heavy		
Avg Depth (cm)		Depth of mud: <u>None</u> <1cm: 1-5cm: 5-10cm: >10cm		
Staff gauge		Litter: <u>None</u> - Present - Moderate - Abundant		
Velocity	Colour	Filamentous Algae:		Sewage Fungus:
Torrential	<u>None</u>	<u>None</u> - Present - Moderate - Abundant		<u>None</u> - Present - Moderate - Abundant
<u>Fast</u>	Slight	Main land use u/s:		Sample retained:
Moderate	Moderate	<u>Pasture</u>	Urban	Y/N
Slow	High	Bog	Tillage	
Very slow		Forestry	Other	
Clarity	Discharge			Sampled in Minutes:
Very clear	Flood			Pond net x <u>3</u>
<u>Clear</u>	<u>Normal</u>			Stone wash x <u>3</u>
Slightly turbid	Low			Weed sweep x <u>0</u>
Highly turbid	Very Low			
	Dry			
	Recent Flood			

General Comments:

Macroinvertebrate Composition

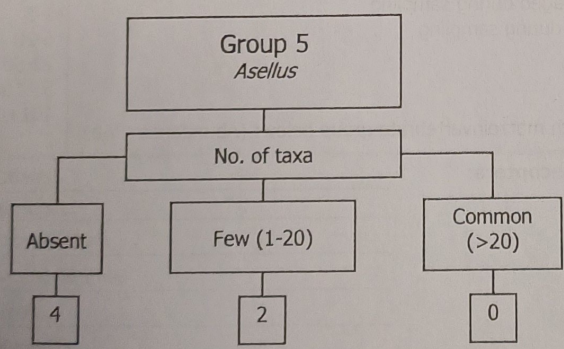
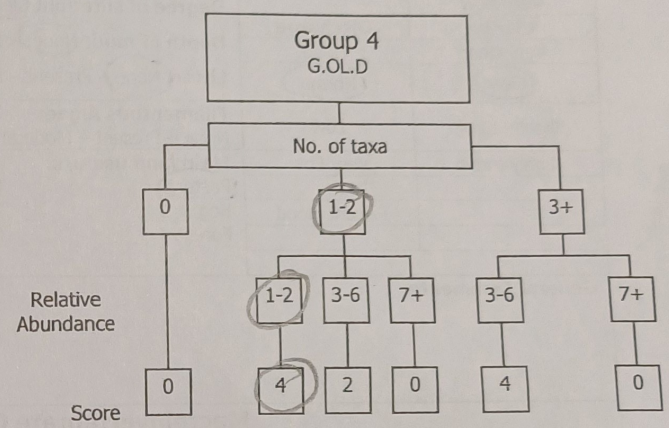
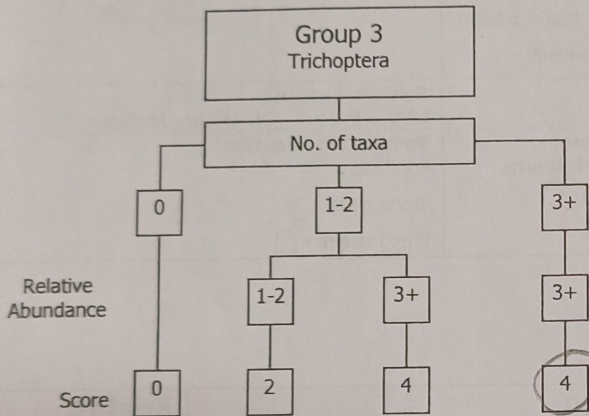
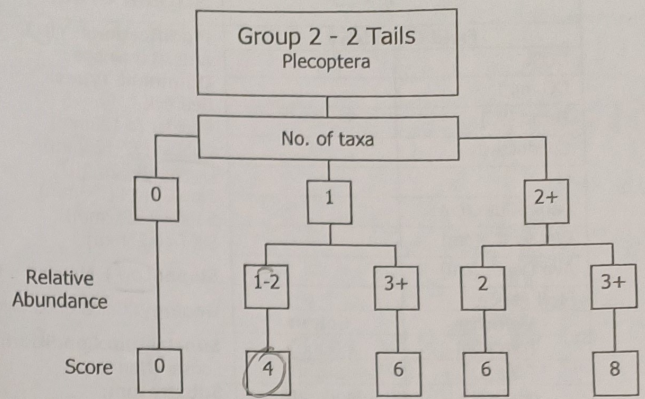
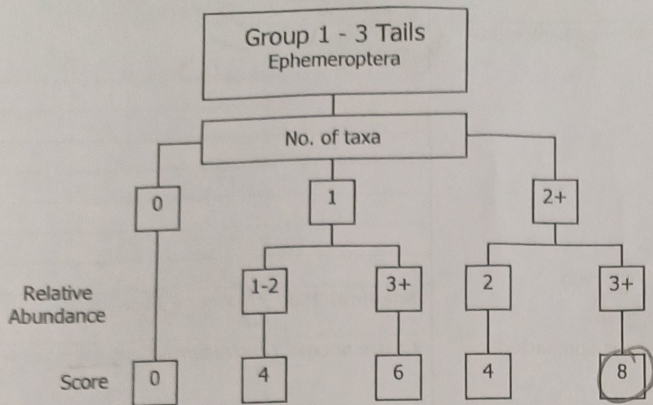
- The macroinvertebrates are divided into the following 5 specific groups:
- Group 1 = Ephemeroptera (3-tails) - note that tails may be damaged during sampling
 - Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
 - Group 3 = Trichoptera
 - Group 4 = G.O.L.D (Gastropoda, 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 <u>2</u>	Plecoptera:		<i>Leuctra</i> Ab <u>2</u>
		<i>Rhithrogena</i> Ab <u>1</u>			<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	<u>2</u>	Total Relative Abundance	<u>2</u>	Total no. of Taxa	<u>1</u>
				Total Relative Abundance	<u>2</u>
Trichoptera:		G.O.L.D:	<i>Lymnaea</i> (G) Ab	<i>Chironomidae</i> (D) Ab	Asellus:
			<i>Potamopyrgus</i> (G) Ab	<i>Chironomus</i> (D) Ab	Absent <input checked="" type="checkbox"/>
			<i>Planorbis</i> (G) Ab	<i>Simuliidae</i> (D) Ab	Few/Low
			<i>Ancylus</i> (G) Ab	<i>Dicranota</i> (D) Ab	Common/ Numerous
			<i>Physa</i> (G) Ab	<i>Tipulidae</i> (D) Ab	
			<i>Lumbriculus</i> (Ol) Ab	<i>Ceratopogonidae</i> (D) Ab	
			<i>Eiseniella</i> (Ol) Ab	Other GOLD Ab	
			<i>Tubificidae</i> (Ol) Ab		
Total no. of Taxa	<u>3</u>	Total Relative Abundance	<u>3</u>	Total no. of Taxa	
				Total Relative Abundance	

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*.

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)

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): John P. McEntee Name (print): JP McEntee Date: 25 / 04 / 23

River: FANE	Code:	Date: 25/4/23	Time: 15:15
Station no.: D/S	Location:	Grid (6 figure):	
Field Chemistry		Stream Order:	Stream flow: Riffle Riffle/Glide Slow flow
DO%		Modifications: Y/N Canalised-widened-bank erosion-arterial drainage	
DO mg/l		Dominant Types:	
Temp (°C)		Bedrock	
Conductivity		Boulder (>128mm)	
pH		Cobble (32-128mm)	
Bank width (cm)		Gravel (8-32mm)	
Wet width (cm)		Fine Gravel (2-8mm)	
Avg Depth (cm)		Sand (0.25-2mm)	
Staff gauge		Silt (<0.25mm)	
Velocity	Colour	Slope: Low - Medium - High - Very High	Shading: High - Moderate - Low - None
Torrential	None	Geology: Calcareous-Siliceous-Mixed	Cattle access: Y upstream - downstream or N
Fast	Slight	Substratum Condition: Calcareous-Compacted-Loose - Normal	
Moderate	Moderate	Substratum:	
Slow	High	Stoney bottom-Muddy bottom-Mud over stones	Photo: Y/N
Very slow		Degree of siltation: Clean-Slight-Moderate-Heavy	
Clarity	Discharge	Depth of mud: None <1cm: 1-5cm: 5-10cm: >10cm	
Very clear	Flood	Litter: None - Present - Moderate - Abundant	
Clear	Normal	Filamentous Algae:	Sewage Fungus:
Slightly turbid	Low	None - Present - Moderate - Abundant	None - Present - Moderate - Abundant
Highly turbid	Very Low	Main land use u/s:	Sample retained:
	Dry	Pasture Urban	Y/N
	Recent Flood	Bog Tillage	
		Forestry Other	
			Sampled in Minutes:
			Pond net x 3
			Stone wash x 3
			Weed sweep x 0

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	2
<i>Rhithrogena</i> Ab	1
<i>Heptagenia</i> Ab	
<i>Ephemerella</i> Ab	
<i>Caenis</i> Ab	
<i>Paraleptophlebia</i> Ab	
<i>Ephemera danica</i> Ab	1
Other Ephem Ab	
Total no. of taxa	2
Total Relative Abundance	4

Plecoptera:

<i>Leuctra</i> Ab	2
<i>Isoptera</i> Ab	
<i>Protonemura</i> Ab	
<i>Amphinemura</i> Ab	
<i>Perla</i> Ab	
<i>Dinocras</i> Ab	
Other Plecop Ab	
Other Plecop Ab	
Total no. of Taxa	1
Total Relative Abundance	2

Trichoptera:

Hydropsychidae Ab	1
Polycentropodidae Ab	
<i>Rhyacophila</i> Ab	1
Philopotamidae Ab	
Limnephilidae Ab	1
Sericostomatidae Ab	
Glossosomatidae Ab	
Lepidostomatidae Ab	
Other Trichoptera Ab	
Total no. of Taxa	3
Total Relative Abundance	3

G.O.L.D:

<i>Lymnaea</i> (G) Ab	
<i>Potamopyrgus</i> (G) Ab	
<i>Planorbis</i> (G) Ab	
<i>Ancylus</i> (G) Ab	
<i>Physa</i> (G) Ab	
<i>Lumbriculus</i> (Ol) Ab	
<i>Eiseniella</i> (Ol) Ab	
Tubificidae (Ol) Ab	
Total no. of Taxa	1
Total Relative Abundance	1

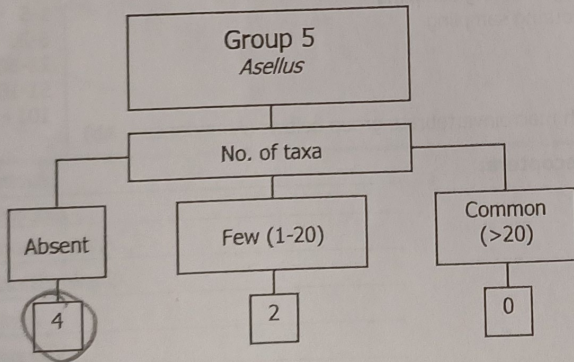
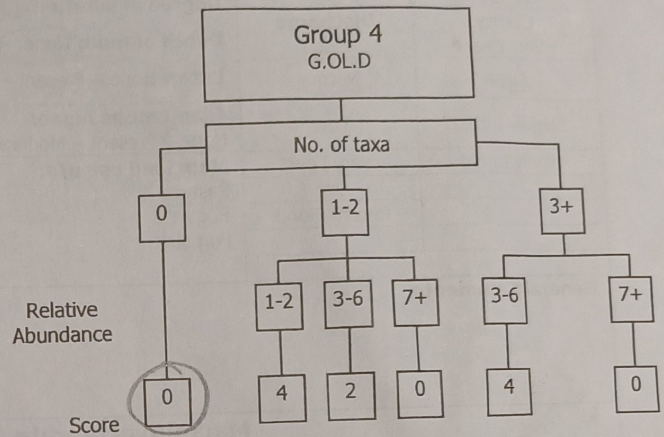
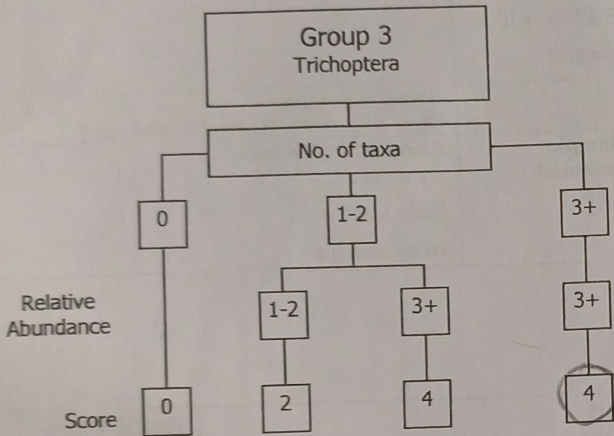
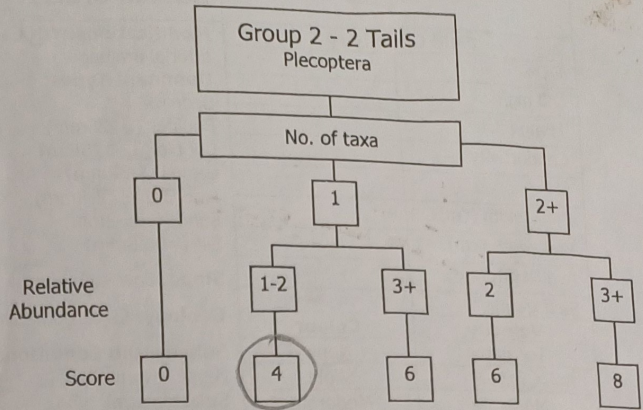
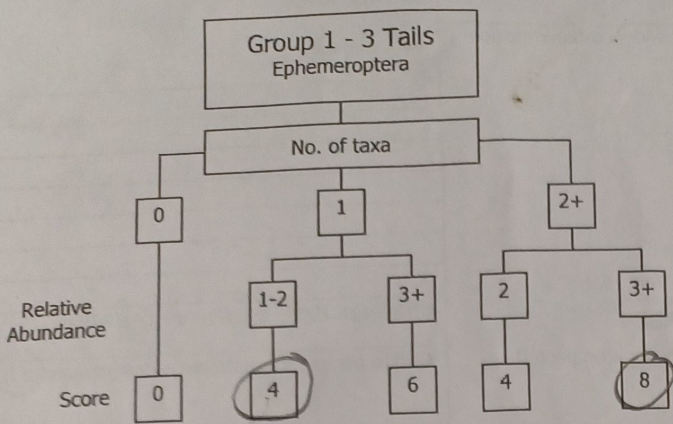
Chironomidae (D) Ab

<i>Chironomus</i> (D) Ab	
Simuliidae (D) Ab	
<i>Dicranota</i> (D) Ab	
Tipulidae (D) Ab	1
Ceratopogonidae (D) Ab	
Other GOLD Ab	
Asellus:	
Absent	
Few/Low	X
Common/Numerous	

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 not counted in SSFS. See Appendix B for more details on how to identify *Baetis*.

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) $\text{sum}(a+b+c+d+e)$

Average Index Score (AIS) $\text{TIS}/5$ (5 for 5 groups)

SSR Score (AIS x 2)

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): [Signature] Name (print): JP M'CENTEE Date: 25 / 4 / 23