

Annual Environmental Report

2020



Raphoe

D0209-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2020 AER

This Annual Environmental Report has been prepared for D0209-01, Raphoe, in Donegal 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 was no major capital or operational changes undertaken in 2020.

1.2 TREATMENT SUMMARY

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

- RAPHOE WWTP - 2020 with a Plant Capacity PE of 800, the treatment type is 2 - Secondary treatment

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
TPEFF0600D0209SW001	RAPHOE WWTP - 2020	Treated	Non-Compliant	Ammonia-Total (as N) mg/l BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l ortho-Phosphate (as P) - unspecified mg/l

1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
Small Stream Risk Score Assessment	Yes

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 RAPHOE WWTP - 2020 - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - RAPHOE WWTP - 2020

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
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	339	94.69
Total Nitrogen mg/l	12	57.3	20.68
Total Phosphorus (as P) mg/l	12	8.36	2.81
COD-Cr mg/l	12	626	178.12
Suspended Solids mg/l	12	370	97.34
Hydraulic Capacity	N/A	3395	1108.25

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 - TPEFF0600D0209SW001

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 with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	12	2	N/A	62.4	Pass
Suspended Solids mg/l	35	87.5	N/A	12	2	N/A	19	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.25	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	5	10	N/A	12	11	6	14.58	Fail
Ammonia-Total (as N) mg/l	0.25	0.5	N/A	12	12	11	7.92	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.15	0.18	N/A	12	12	12	2.04	Fail
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	16.3	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	2.3	
Conductivity @20°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	447.26	

Notes:

1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied

Cause of Exceedance(s):

Plant is currently overloaded. WWTP is not designed for nutrient removal. Refer to Incident Section of Report.

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 TPEFF0600D0209SW001

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 Status
Upstream	225791, 401979	RS01S030150	No	No	No	No	Poor
Downstream	226417, 401895	RS01S030200	No	No	No	No	Poor

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	RS01S030150	1.875	RS01S030200	2.508	1.5	42.2
Ammonia-Total (as N) mg/l	RS01S030150	0.161	RS01S030200	0.289	0.065	196.3
ortho-Phosphate (as P) - unspecified mg/l	RS01S030150	0.059	RS01S030200	0.19	0.035	372.3
pH pH units	RS01S030150	7.478	RS01S030200	7.429		
Dissolved Oxygen % Saturation	RS01S030150	95.167	RS01S030200	87.536		
Temperature °C	RS01S030150	11.3	RS01S030200	11.143		
Suspended Solids mg/l	RS01S030150	12.557	RS01S030200	15.621		
Conductivity @20°C µS/cm	RS01S030150	343.222	RS01S030200	358.444		

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results does not meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

Based on ambient monitoring results a deterioration in Ammonia - Total (as N), BOD, Ortho-Phosphate (as P) , concentrations downstream of the effluent discharge is noted.

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

Other causes of deterioration in water quality in the area are: There is a high frequency of agricultural lands and farms within the locale that could potentially cause impact to the water course. The collection network is combined and is affected by storm flows within a large catchment area that potentially could cause impact to the discharge from the WWTP.

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 - RAPHOE WWTP - 2020

2.1.4.1 Treatment Efficiency Report - RAPHOE WWTP - 2020

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	8365	5602	33
cBOD	38302	5011	87
TP	1136	790	30
COD	72050	21449	70
SS	39374	6531	83

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

2.1.4.2 Treatment Capacity Report Summary - RAPHOE WWTP - 2020

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.

RAPHOE WWTP - 2020	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	1282
DWF to the Treatment Plant (m ³ /day)	335
Current Hydraulic Loading - annual max (m ³ /day)	3395
Average Hydraulic loading to the Treatment Plant (m ³ /day)	1108.25
Organic Capacity (PE) - As Constructed	800
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	1746
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 - RAPHOE WWTP - 2020

'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 is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2020.			

3.2 REPORTED INCIDENTS SUMMARY

Environmental incidents that arise in an agglomeration are reported on an on-going basis in accordance with our waste water discharge licences. Where an incident occurs and it is reportable under the licence, it is reported to the Environmental Protection Agency through their Environmental Data Exchange Network, or in some instances by telephone. Some incidents which arise in the agglomeration are recorded by Irish Water but may not be reportable under our licence for example where the incident does not have an impact on environmental performance.

A summary of reported incidents is included below.

3.2.1 SUMMARY OF INCIDENTS

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Breach of ELV	WWTP operating above capacity	1	Yes	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2020	1
Number of Incidents reported to the EPA via EDEN in 2020	1
Explanation of any discrepancies between the two numbers above	N/A

4 INFRASTRUCTURAL ASSESSMENTS AND PROGRAMME OF IMPROVEMENTS

4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT

A summary of the operation of the storm water overflows and their significance where known is included below:

4.1.1 SWO IDENTIFICATION

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2020 (No. of events)	Total volume discharged in 2020 (m3)	Monitoring Status
SW002	225897, 401986	Yes	Low	Meeting	Unknown	Unknown	Monitored
TBC	226743, 403256	No	Unknown	Not yet Assessed	Unknown	Unknown	Unknown

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	Yes
The SWO Assessment included the requirements of relevant of WWDL schedules?	No
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 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
D0209-SIP:01	Increase the treatment capacity of the WWTP	C	31/12/2015	Yes	At Planning Stage		The required works are not currently funded in the 2020-2024 period, and will be considered when planning for the next investment plan period.
D0209-SIP:02	Installation of storm water storage tank	C	31/12/2015	Yes	At Planning Stage		The required works are not currently funded in the 2020-2024 period, and will be considered when planning for the next investment plan period.
D0209-SIP:03	Provide nutrient removal	C	31/12/2015	Yes	At Planning Stage		The required works are not currently funded in the 2020-2024 period, and will be considered when planning for the next investment plan period.

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
D0209-SIP:04	Provide tertiary treatment	C	31/12/2015	Yes	At Planning Stage		The required works are not currently funded in the 2020-2024 period, and will be considered when planning for the next investment plan period.
D0209-SIP:05	Upgrading of Storm Water Overflows to comply with the criteria outlined in the DoECLG "Procedures and Criteria in relation to Storm Water Overflows, 1995"	C	31/12/2015	Yes	At Planning Stage		The required works are not currently funded in the 2020-2024 period, and will be considered when planning for the next investment plan period.

A summary of the status of any improvements identified by under Condition 5.2 is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
There are no Improvements Programme for this Agglomeration.				

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 Table.

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 list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER
Priority Substances Assessment	Yes	2015	No	
Small Stream Risk Score Assessment	Yes	2020	Yes	5.2

5.1 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2015

5.2 SMALL STREAM RISK SCORE ASSESSMENT

The Small Stream Risk Score Assessment Report is included in Appendix 7.1 - Small Stream Risk Score Assessment. A summary of the findings of this report is included below.

Parameter	Value
Condition 5 Improvement Programme Reference	N/A

Parameter	Value
Does SSRS indicate discharges are posing a pollution risk?	No
Downstream SSRS Water Quality Risk	Moderately Polluted
SSRS Required?	Yes
Upstream SSRS Water Quality Risk	Moderately Polluted
What is Downstream SSRS?	Q3
What is Upstream SSRS?	Q3
Does improvement programme include any procedural and/or infrastructural works?	N/A

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?	Yes
List reason e.g. additional SWO identified	New WWTP and new primary discharge point.
Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc	N/A
List reason e.g. changes to monitoring requirements	N/A
Have these processes commenced?	Yes
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:

Signed: Date: 04/05/2021

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

Katherine Walshe

Acting Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

Upstream (v/s Raphoe)

River: Swilly Burn
Station no. 202503517

Code: Date: 22/12/20 Location: Raphoe, upstream

Time: 11-35

Grid (6 figure):

Field Chemistry

DO% 90.3
DO mg/l
Temp (°C) 5°C
Conductivity 331
pH 7.3
Bank width (cm) 300
Wet width (cm) 200
Avg Depth (cm) 30
Staff gauge
Velocity Colour None
Torrential None
Fast Slight
Moderate Moderate
Slow High
Very slow
Clarity Discharge Flood
Very clear Flood
Clear
Slightly turbid Low
Highly turbid Very Low
Recent Flood

Stream Order:
Modifications: Y/N
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 Moderate None Very High
Geology: Calcareous
Substratum Condition: Calcareous
Loose Normal
Substratum: Stony bottom Muddy bottom Mud over stones
Degree of siltation: Clear Slight Moderate Heavy
Depth of mud: None
Litter: None Present Moderate Abundant
Filamentous Algae: None - Present - Moderate
Main land use u/s: Pasture
Sample retained: Y/N

Stream flow: Riffle
Giffle/Glide
Slow flow

Shading: High - Moderate Low None

Cattle access Y upstream downstream

Photo: Y / N

Seaweed/Fungus: None Present Moderate Abundant
Sampled in Minutes: 10
Pool depth: 10
Scale wash: 10
Wool sweep: /

General Comments:

Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:
Group 1 - Ephemeroptera (tails) - note that tails may be damaged during sampling
Group 2 - Plecoptera (dobsonflies) - note that tails may be damaged during sampling
Group 3 - Trichoptera
Group 4 - G.O.L.D. (amphipods, water beetles and Diptera)
Group 5 - Asellus
Calculate the total number of taxa and relative abundance of each group.

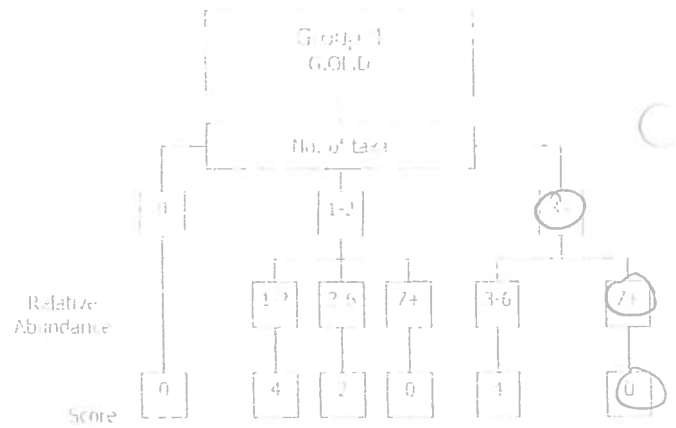
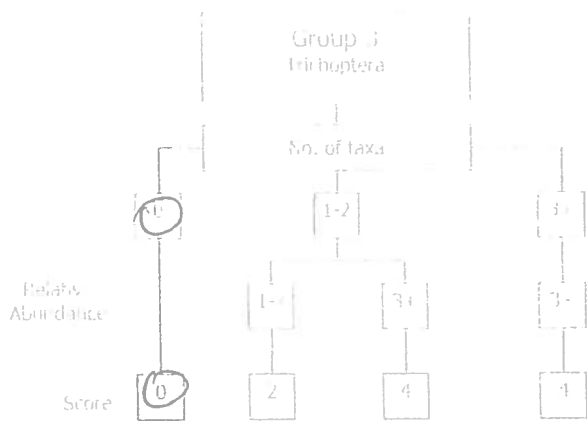
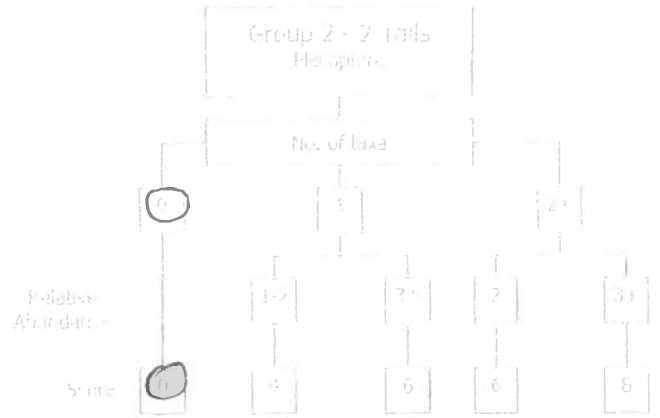
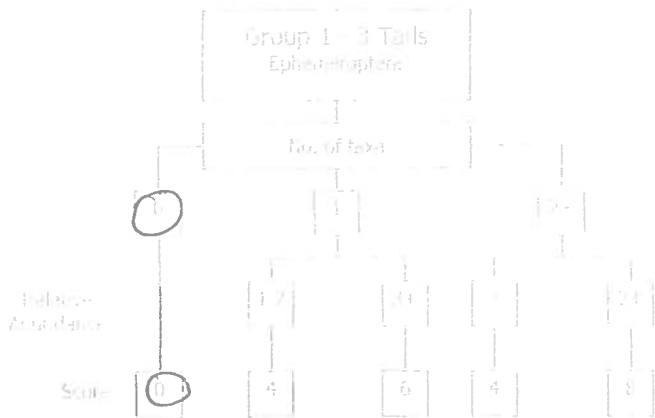
Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		Plecoptera:		Trichoptera:		G.O.L.D.:		Chironomidae (D) Ab:		Asellus:	
<i>Traylorrus</i> Ab				Hydropsychidae Ab		<i>Lymnaea</i> (G) Ab		Chironomus (D) Ab		Absent	✓
<i>Rhythrogena</i> Ab				Polycentropodidae Ab		<i>Potamopyrgus</i> (G) Ab		Simuliidae (D) Ab		Few/Low	
<i>Heptagenia</i> Ab				<i>Rhyacophila</i> Ab		<i>Planorbis</i> (G) Ab		<i>Dicranota</i> (D) Ab		Common/ Numerous	
<i>Ephemerella</i> Ab				Philopotamidae Ab		<i>Ancyclus</i> (G) Ab		Tipulidae (D) Ab			
<i>Caenis</i> Ab				Limnephilidae Ab		<i>Physa</i> (G) Ab		Ceratopogonidae (D) Ab			
<i>Paraleptopnebia</i> Ab				Sericostomatidae Ab		<i>Lumbriculus</i> (O) Ab		Other GOLD Ab			
<i>Ephemeria danica</i> Ab				Glossosomatidae Ab		<i>Eiseniella</i> (O) Ab					
Other Ephem Ab				Lepidostomatidae Ab		Tubificidae (O) Ab					
				Other Trichoptera Ab							
Total no. of taxa	0	Total Relative Abundance		Total no. of Taxa	0	Total Relative Abundance		Total no. of Taxa	3	Total Relative Abundance	7

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.

Step 1. Calculate the Index Score by dividing the proportion (as represented in the total number of taxa) of each macroinvertebrate abundance calculated from *each macroinvertebrate group* calculated from page 1 of the recording sheet and enter it 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

0
0
0
0
4

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): Don Smith Name (print): DON SMITH Date: 22 / 12 / 20

River: d/s Swilly burn
 Station no: 202503518

Code: 22/12/20
 Location: Raphoe, Downstream

Time: 11.55
 Grid (6 figure):

Field Chemistry

DO%	89.1
DO mg/l	—
Temp (°C)	4.5
Conductivity	351
pH	7.4
Bank width (cm)	350
Wet width (cm)	250
Avg Depth (cm)	30
Staff gauge	
Velocity	Colour
Torrential	None
<u>Fast</u>	Slight
Moderate	Moderate
Slow	High
Very slow	
Clarity	Discharge
Very clear	Flood
<u>Clear</u>	Normal
Slightly turbid	Low
Highly turbid	Very Low
	Dry
	Recent Flood

Stream Order:
 Modifications: Y/N Channel Obstruction
 arterial drainage
 Dominant Types:
 Bedrock
 Boulder (>128mm)
Cobble (> 128mm)
 Gravel (8-32mm)
 Fine Gravel (2-8mm)
 Sand (0.25-2mm)
 Silt (<0.25mm)
 Slope: LW Moderate High Very High
 Geology: Calcareous Siliceous Gneiss
 Substratum Condition: Calcareous Crystalline
 Loose: Normal
 Substratum:
Stoney bottom Muddy bottom Mud over stones
 Degree of siltation: Clear Slight Moderate Heavy
 Depth of mud: 0
 Litter: None Present Moderate Abundant
 Filamentous Algae:
 None Present Moderate Abundant
 Main land use u/s: Pasture Urban Sample retained:
 Bog Tillage Yes/No
 Forestry Other

Stream flow:
 Piffa
Effluent
 Slow flow
 Shading: High Moderate Low None
 Cattle access: Y Upstream downstream N
 Photo: Y / N
 Sewage Fungus:
 None Present Moderate Abundant
 Sampled in Minutes:
 Ponit net x 10
 Stone wash x 10
 Wheel 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.O.L.D. (Gastropods, Oligochaetes and Diplopoda)
 Group 5: Asellus
 Calculate the total number of taxa and relative abundance for each of the 5 groups (Macroinvertebrates).

Relative Abundance

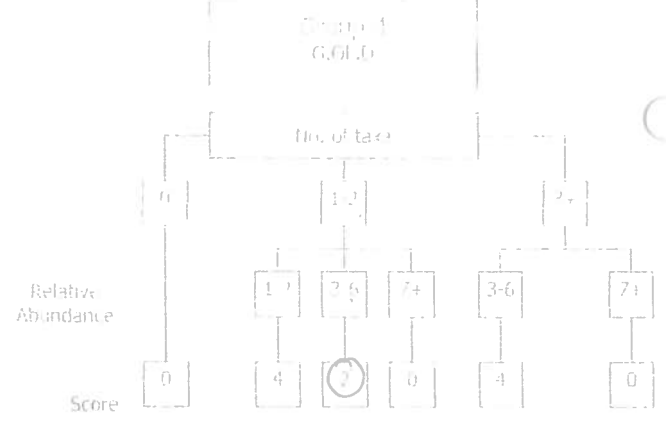
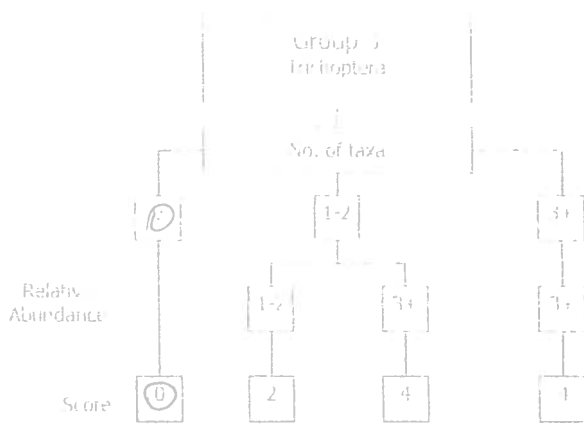
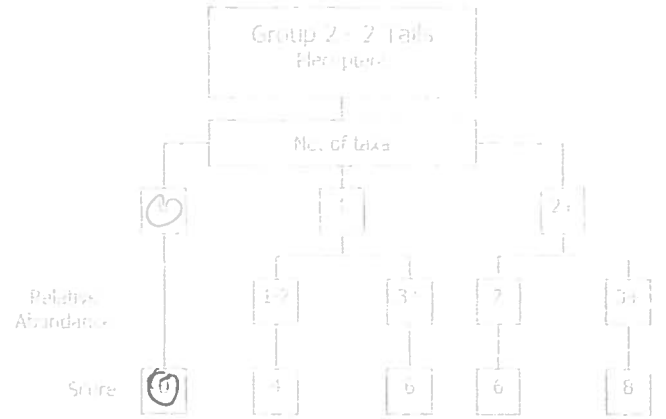
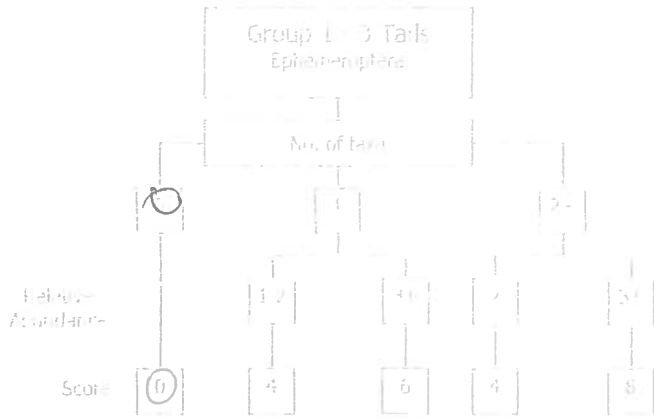
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		Plecoptera:		Relative Abundance	
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab		1-5	1
<i>Rhythrogena</i> Ab		<i>Isoperla</i> Ab		6-20	2
<i>Heptagenia</i> Ab		<i>Protonemura</i> Ab		21-50	3
<i>Ephemerella</i> Ab		<i>Aniphitemura</i> Ab		51-100	4
<i>Caenis</i> Ab		<i>Pera</i> Ab		101+	5
<i>Paraleptopnebia</i> Ab		<i>Dinocras</i> Ab			
<i>Ephemerella danica</i> Ab		Other Plecop Ab			
Other Ephem Ab		Other Plecop Ab			
Total no. of taxa <u>0</u>	Total Relative Abundance	Total no. of Taxa <u>0</u>	Total Relative Abundance	<u>0</u>	
Trichoptera:		G.O.L.D.:		Asellus:	
Hydropsychidae Ab		<i>Limnæa</i> (G) Ab		Chironomidae (D) Ab	
Polycentropodidae Ab		<i>Potamopyrgus</i> (G) Ab		<i>Chironomus</i> (D) Ab	Absent ✓
<i>Rhyacophila</i> Ab		<i>Panorhis</i> (G) Ab		Simuliidae (D) Ab	<u>4</u> Few/Low
Philopotamidae Ab		<i>Ancyliis</i> (G) Ab		<i>Dicranota</i> (D) Ab	Common/Numerous
Limnephilidae Ab		<i>Physa</i> (G) Ab		Tipulidae (D) Ab	
Sericostomatidae Ab		<i>Lumbriculus</i> (O) Ab		Ceratopogonidae (D) Ab	<u>1</u>
Glossosomatidae Ab		<i>Eiseniella</i> (O) Ab		Other GOLD Ab	
Lepidostomatidae Ab		Tubificidae (O) Ab			
Other Trichoptera Ab					
Total no. of Taxa <u>0</u>	Total Relative Abundance <u>0</u>	Total no. of Taxa <u>2</u>	Total Relative Abundance <u>5</u>		

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*.

Step 1. Calculate the Index Score by ordering the dipterid taxa (not 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 it 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: 4

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) **6**

Average Index Score (AIS) TIS/5 (5 for 5 groups) **1.2**

SSR Score (AIS x 2) **2.4**

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): Don Smith Name (print): DON SMITH Date: 22 / 12 / 20