Annual Environmental Report

2022

Summerhill

D0259-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2022 AER

This Annual Environmental Report has been prepared for D0259-01, Summerhill, in Meath 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 2022.

1.2 TREATMENT SUMMARY

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

- Summerhill WWTP with a Plant Capacity PE of 3000, 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
TPEFF2300D0259SW001	Summerhill 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 SUMMERHILL WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - SUMMERHILL 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	12	1145	400
Total Phosphorus (as P) mg/l	12	12	4.64
BOD, 5 days with Inhibition (Carbonaceous) mg/l	12	706	213
Ammonia-Total (as N) mg/l	6	53	27
Suspended Solids mg/l	12	995	172
ortho-Phosphate (as P) - unspecified mg/l	6	7.56	3.36
Total Nitrogen mg/l	12	71	31
Hydraulic Capacity	N/A	1136	364

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 - TPEFF2300D0259SW001

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	19	Pass
Suspended Solids mg/l	35	87.5	N/A	12	N/A	N/A	4.73	Pass
pH pH units	6.00	9.00	N/A	12	N/A	N/A	7.73	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	5.00	10	N/A	12	N/A	N/A	2.03	Pass
Ammonia-Total (as N) mg/l	1.00	2.00	N/A	12	1	N/A	0.067	Pass
ortho-Phosphate (as P) - unspecified mg/l	0.500	0.600	N/A	12	N/A	N/A	0.082	Pass
Total Nitrogen mg/l	N/A	N/A	N/A	6	N/A	N/A	6.46	

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 Phosphorus (as P) mg/l	N/A	N/A	N/A	6	N/A	N/A	0.182	

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 TPEFF2300D0259SW001

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	285788, 248965	RS07K020200	No	No	No	No	Poor
Downstream	283268, 250875	RS07K020300	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	RS07K020200	1.55	RS07K020300	1.34	1.50	-14.5
Ammonia-Total (as N) mg/l	RS07K020200	0.081	RS07K020300	0.087	0.065	9.9
ortho-Phosphate (as P) - unspecified mg/l	RS07K020200	0.121	RS07K020300	0.098	0.035	-66.3
Total Nitrogen mg/l	RS07K020200	2.18	RS07K020300	2.55	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
Dissolved Oxygen mg/l	RS07K020200	9.76	RS07K020300	10	N/A	
Dissolved Oxygen % Saturation	RS07K020200	84	RS07K020300	89	N/A	
pH pH units	RS07K020200	8.03	RS07K020300	8.06	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 Ammonia concentration downstream of the effluent discharge is noted.

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

As per the 3rd Cycle Draft Boyne Catchment Report (HA 07), the significant pressures on the Knightsbrook_020 waterbody is Agriculture.

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 - SUMMERHILL WWTP

2.1.4.1 Treatment Efficiency Report - Summerhill 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)
SS	20957	486	98
cBOD	25888	209	99
TN	3836	645	83
TP	566	18	97
COD	48675	2002	96

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

2.1.4.2 Treatment Capacity Report Summary - Summerhill 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.

Summerhill WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	2025
DWF to the Treatment Plant (m^3/day)	675
Current Hydraulic Loading - annual max (m^3/day)	1136
Average Hydraulic loading to the Treatment Plant (m^3/day)	364
Organic Capacity (PE) - As Constructed	3000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	1077
Organic Capacity (PE) - Remaining	1923
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 - SUMMERHILL 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)
There were no reportable incidents in 2022.				

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2022	0
Number of Incidents reported to the EPA via EDEN in 2022	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 2022 (No. of events)	Total volume discharged in 2022 (m^3)	Monitoring Status
SW2	284910 249401	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
D0259-SIP:01	Assessment of the options to reduce the impact of the primary discharge on the Cloneymeath River in accordance with Condition 5.2(d)	C	28/02/2013	Yes	Not Started		Capital works not funded in RC3. Capital works funding post 2024 will be contingent on the project being included in the 2025-2029 investment period.

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
Priority Substances Assessment	Yes	2014	No
Small Stream Risk Score Assessment	Yes	2017	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	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: 29/03/2023

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.

7 APPENDIX

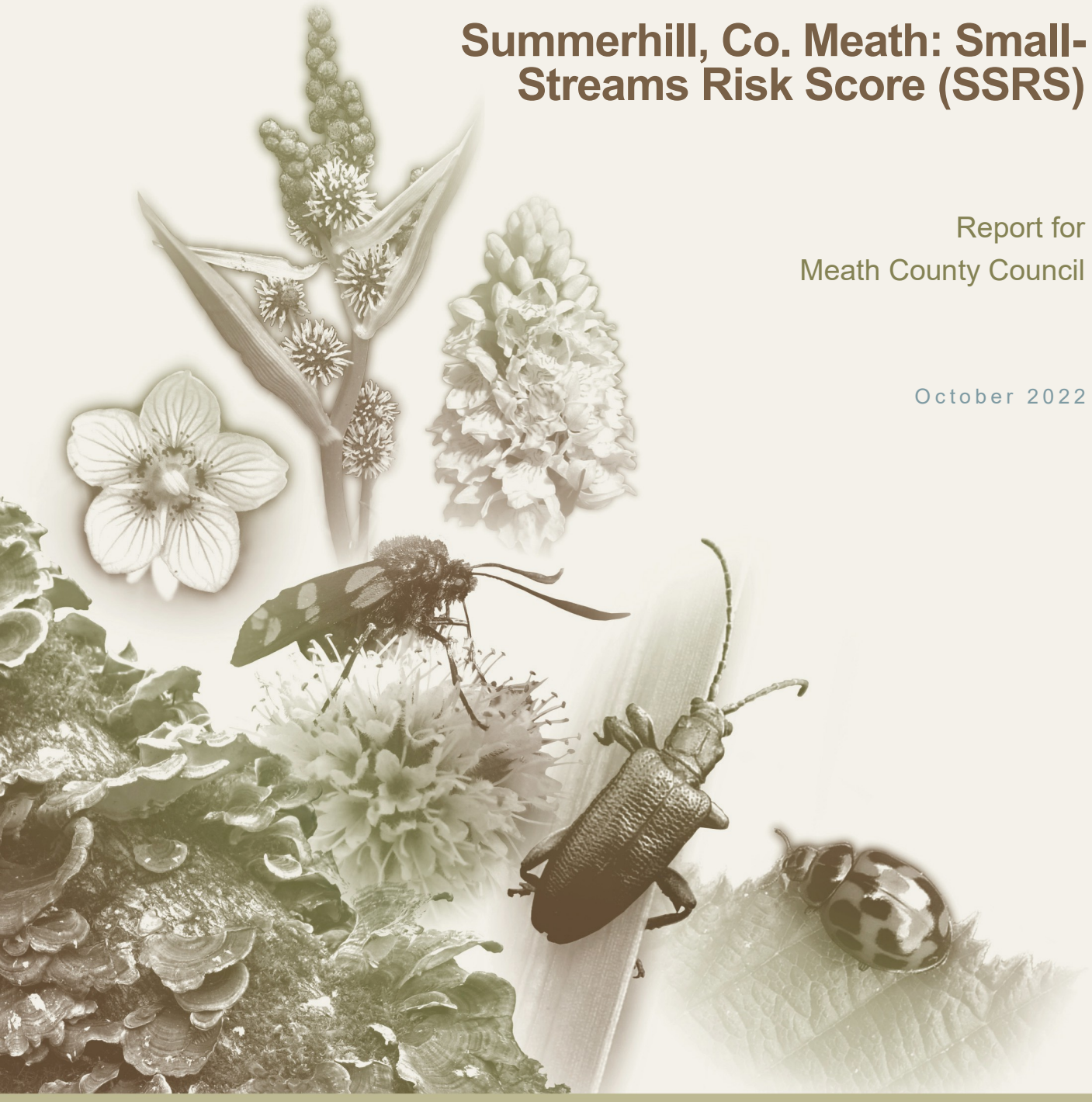
Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

bec CONSULTANTS

Summerhill, Co. Meath: Small-Streams Risk Score (SSRS)

Report for
Meath County Council

October 2022



John T. Brophy

Summerhill, Co. Meath: Small-Streams Risk Score (SSRS)

Report prepared for:

Meath County Council,
Buvinda House, Dublin Road
Navan,
Co. Meath.

October 2022

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DOCUMENT CONTROL SHEET

Client	Meath County Council
Project title	Summerhill SSRS
Project number	PRJ335
Document title	Summerhill Small-Streams Risk Score (SSRS)
Citation	Brophy, J.T. (2022) Summerhill Small-Streams Risk Score (SSRS). Unpublished Report by BEC Consultants Ltd.

Author(s)	Reviewed by	Approved by	Version	Issue date
John T. Brophy B.A., M.Sc., MCIEEM, CEcol.	Jim Martin PhD, MCIEEM	Jim Martin PhD, MCIEEM	V1.0	07/10/2022

Table of Contents

1 Background

BEC Consultants Ltd was contracted to carry out macroinvertebrate sampling on the Cloneymeath River and calculate a Small-Streams Risk Score (SSRS) for two samples taken upstream and downstream of Summerhill Waste Water Works, Summerhill, Co. Meath.

2 Methods

Two samples were taken on the Cloneymeath River, one upstream (u/s) and one downstream (d/s) of the Summerhill Waste Water Works discharge location by John Brophy of BEC Consultants, who is an EPA-registered SSRS assessor, on 3 October 2022 following the SSRS field methodology (Anon. 2009). The samples were taken using a standard hand-net and the SSRS calculated following the methods set out in the 'Small Streams Risk Score (SSRS) Training Manual' (Anon., 2009).

3 Results

The SSRS groups and taxa recorded from the upstream (u/s) and downstream (d/s) sample stations, with their relative abundances, are presented in Table 1 and Table 2, respectively. No Group 1 or Group 2 taxa were recorded at either sample station.

Table 1. SSRS groups and taxa from the upstream (u/s) sample station on the Cloneymeath River, Summerhill, Co. Meath taken on 3 October 2022.

Group	Taxon	Relative abundance (1-5)
Group 1 Ephemeroptera	-	-
Group 2 Plecoptera	-	-
Group 3 Trichoptera	Sericostomatidae	1
Group 4 G.O.L.D.	Tubificidae	1
	Chironomidae	1
	Chironomus	2
Group 5 *Asellus*	*Asellus*	Common/Numerous

Table 2. SSRS groups and taxa from the downstream (d/s) sample station on the Cloneymeath River, Summerhill, Co. Meath on 3 October 2022.

Group	Taxon	Relative abundance (1-5)
Group 1 Ephemeroptera	-	-
Group 2 Plecoptera	-	-
Group 3 Trichoptera	Hydropsychidae	3
	Polycentropodidae	1
	Glossosomatidae	1
Group 4 G.O.L.D.	Tubificidae	1
	Simuliidae	2
Group 5 *Asellus*	*Asellus*	Few/Low

The SSRS for each sample station was calculated following the methods of Anon. (2009) and the results are presented in Table 3.

Table 3. The Small-Streams Risk Score for two sample stations on the Cloneymeath River, Summerhill, Co. Meath on 3 October 2022.

Sample station	SSRS	Category
Upstream (u/s)	2.4	At risk
Downstream (d/s)	3.2	At risk

The SSRS scoresheets for sites u/s and d/s are presented in Appendix I, with photographs presented in Appendix II.

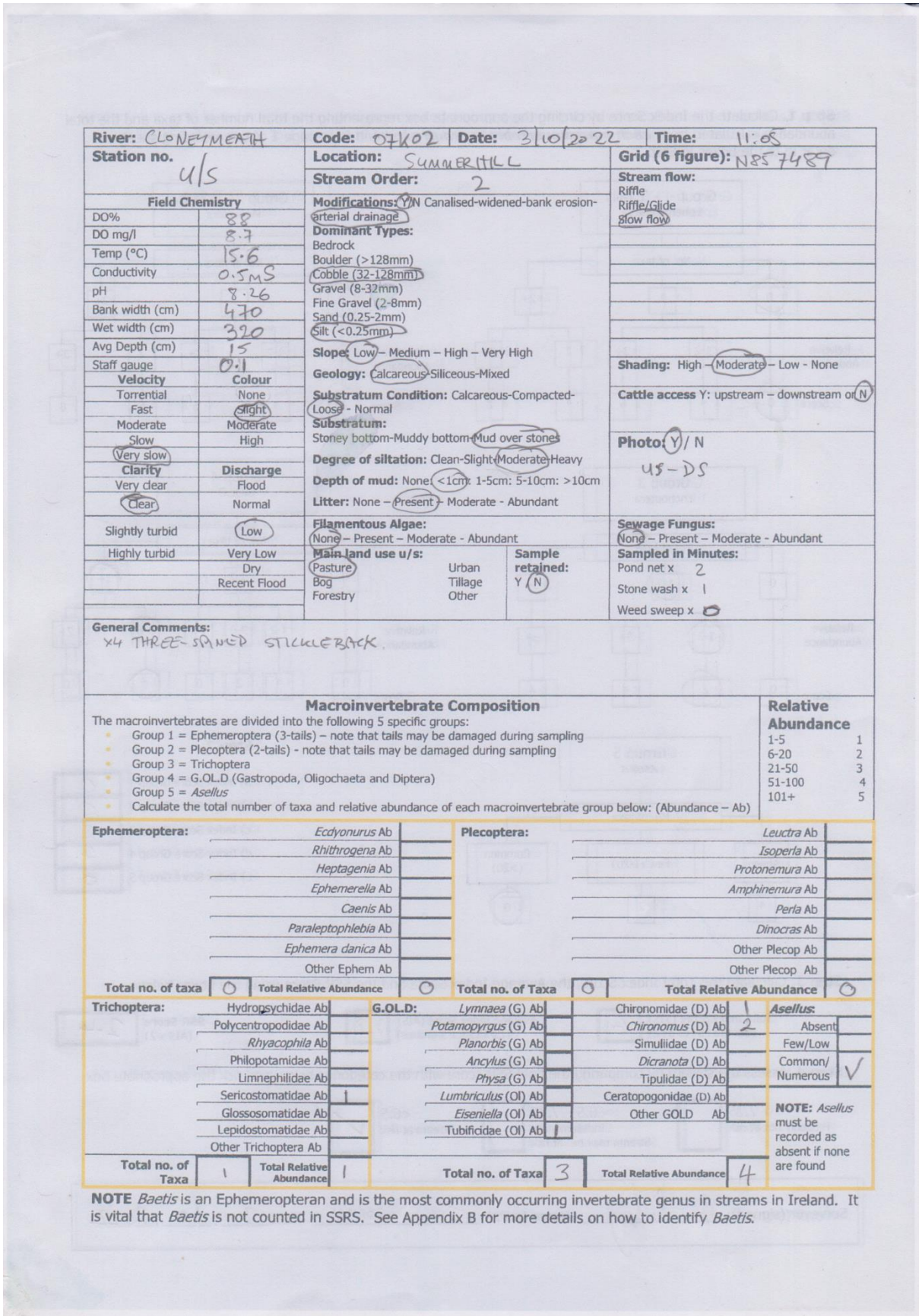
4 Conclusion

The SSRS for the upstream station (U/S) was 2.4, while that for the downstream station (D/S) was 3.2. Therefore, despite the difference in the scores, the Cloneymeath River, at both upstream and downstream locations, is 'At risk' of not meeting 'Good' status under the Water Framework Directive (2000/60/EC).

5 References

Anonymous (2009). Small Streams Risk Score (SSRS) Training Manual: A Pollution Investigation Tool for Use in the Field. Prepared on behalf of the Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Water Services National Training Group (wsntg). (February 2020).

Appendix I – Score sheets



River: CLONEYMEATH | Code: 07K02 | Date: 3/10/2022 | Time: 11:05

Station no. U/S | Location: SUMMERHILL | Grid (6 figure): N857489

Stream Order: 2

Field Chemistry	
DO%	88
DO mg/l	8.7
Temp (°C)	15.6
Conductivity	0.5mS
pH	8.26
Bank width (cm)	470
Wet width (cm)	320
Avg Depth (cm)	15
Staff gauge	0.1
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

Filamentous Algae: None – Present – Moderate - Abundant

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

Sample retained: Y / N

Stream flow: Riffle, Riffle/Glide, Slow flow

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N
US - DS

Sewage Fungus: None – Present – Moderate - Abundant

Sampled in Minutes:
Pond net x 2
Stone wash x 1
Weed sweep x 0

General Comments:
x4 THREE-SPINED STICKLEBACK.

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		Other Plecop Ab	
Total no. of taxa	0	**Total Relative Abundance**	0	**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	2	Few/Low	
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab		Common/ Numerous	√
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab	1	*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab		**NOTE:** *Asellus* must be recorded as absent if none are found	
Lepidostomatidae Ab		Tubificidae (Ol) Ab	1				
Other Trichoptera Ab							
Total no. of Taxa	1	**Total Relative Abundance**	1	**Total no. of Taxa**	3	**Total Relative Abundance**	4

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*.

Figure A1: SSRS score sheet page 1 at upstream (u/s) site on the Cloneymeath River, Summerhill, Co. Meath.

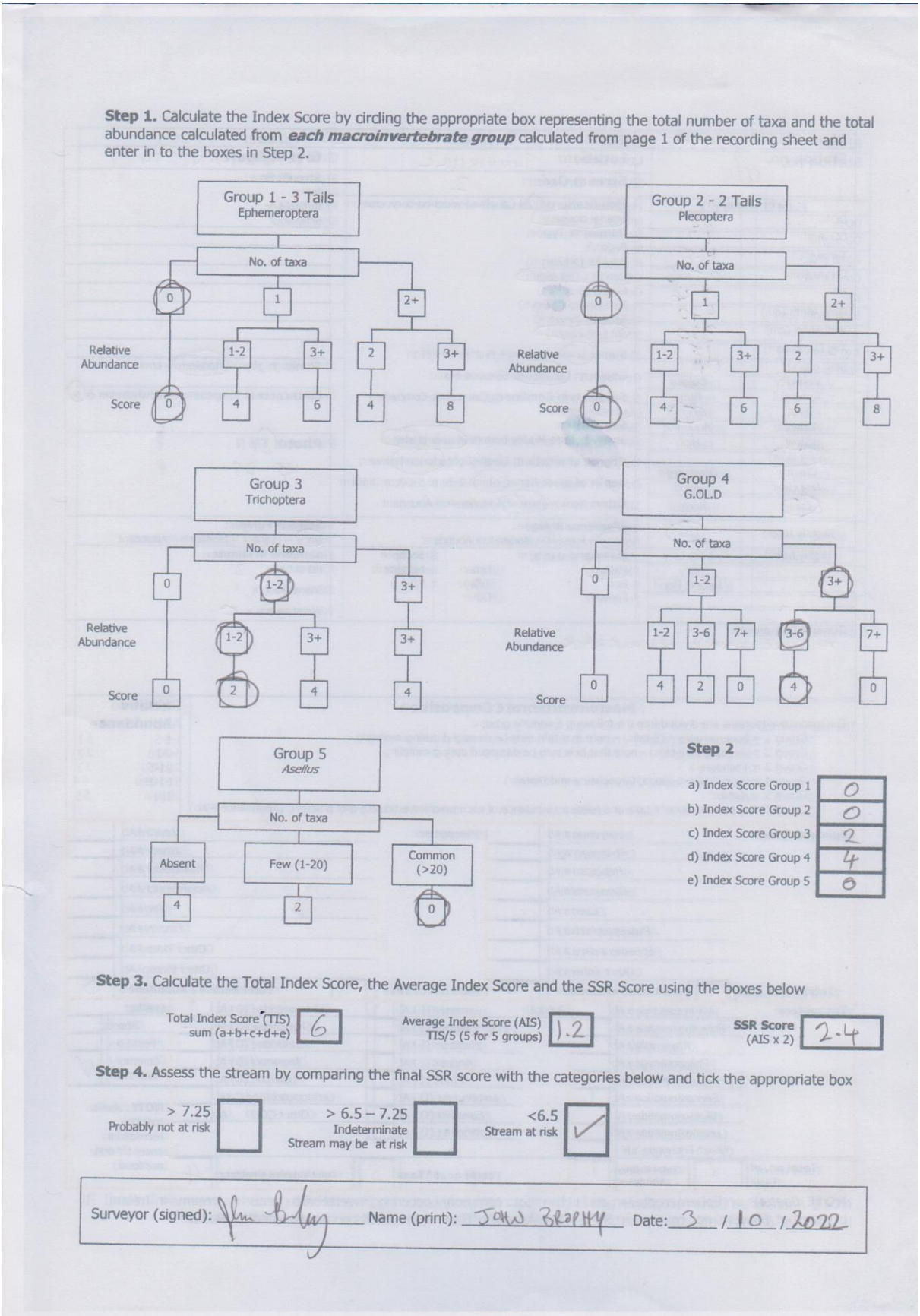
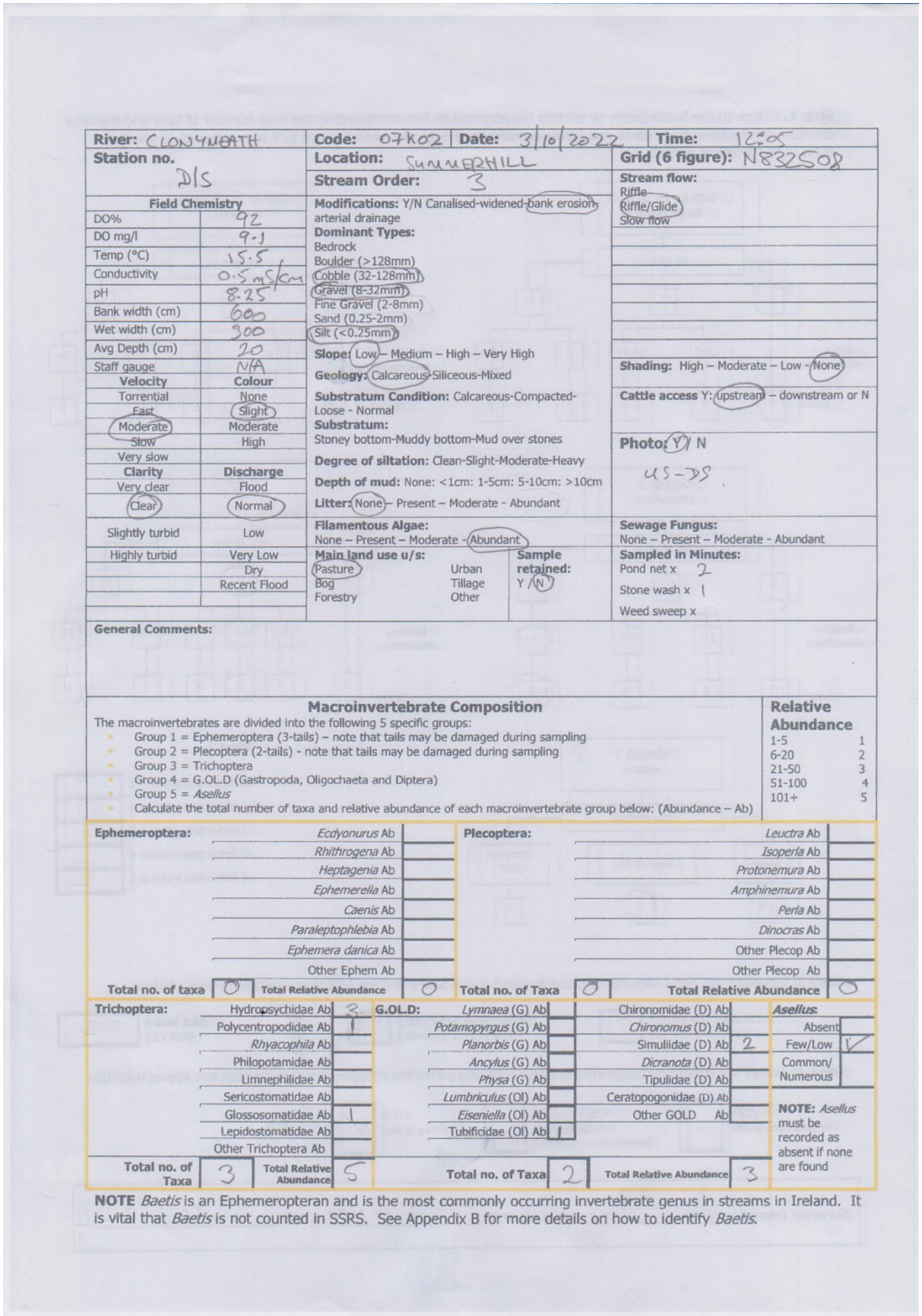


Figure A2: SSRS score sheet page 2 at upstream (u/s) site on the Cloneymeath River, Summerhill, Co. Meath.



River: CLONYMEATH | Code: 07k02 | Date: 3/10/2022 | Time: 12:05

Station no.: D/S | Location: SUMMERHILL | Grid (6 figure): N832508

Stream Order: 3

Stream flow: Riffle / Riffle/Glide / Slow flow

Field Chemistry	
DO%	92
DO mg/l	9.1
Temp (°C)	15.5
Conductivity	0.5 mS/cm
pH	8.25
Bank width (cm)	600
Wet width (cm)	300
Avg Depth (cm)	20
Staff gauge	N/A
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

Filamentous Algae: None – Present – Moderate - Abundant

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

Sample retained: Y / N

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N — US-DS

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		*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		Other Plecop Ab	
Total no. of taxa	0	**Total no. of Taxa**	0
Total Relative Abundance	0	**Total Relative Abundance**	0

Trichoptera:		**G.OL.D:**				***Asellus*:**	
Hydropsychidae Ab	3	*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	
Polycentropodidae Ab	1	*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	✓
Rhyacophila Ab		*Planorbis* (G) Ab		Simuliidae (D) Ab	2	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	1	*Eiseniella* (Ol) Ab		Other GOLD Ab		**NOTE:** *Asellus* must be recorded as absent if none are found	
Lepidostomatidae Ab		Tubificidae (Ol) Ab	1				
Other Trichoptera Ab							
Total no. of Taxa	3	**Total Relative Abundance**	5	**Total no. of Taxa**	2	**Total Relative Abundance**	3

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*.

Figure A3: SSRS score sheet page 1 at downstream (d/s) site on the Cloneymeath River, Summerhill, Co. Meath.

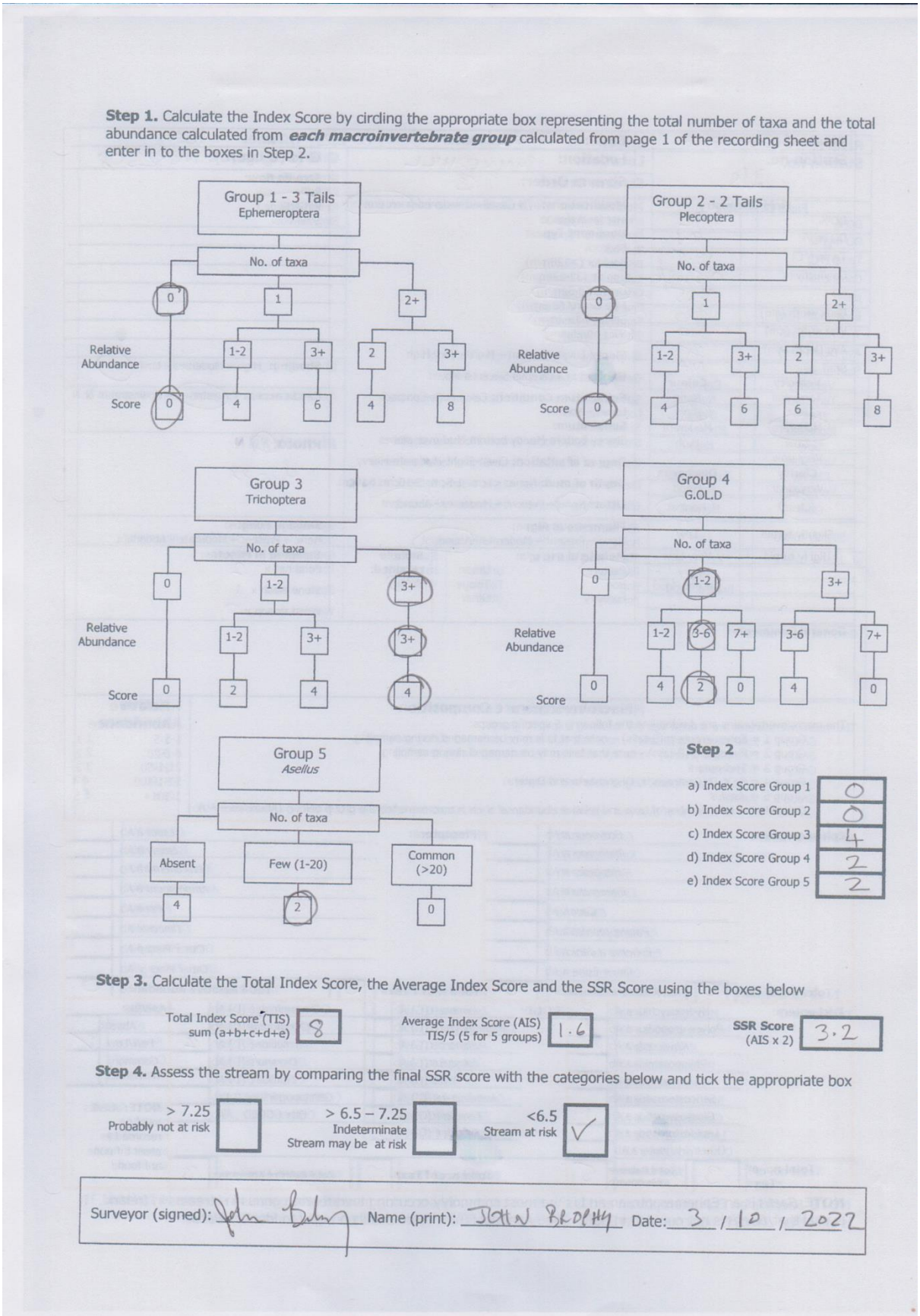


Figure A4: SSRS score sheet page 2 at downstream (d/s) site on the Cloneymeath River, Summerhill, Co. Meath.

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