Annual Environmental Report

2023

Tyrellspass

D0099-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2023 AER

This Annual Environmental Report has been prepared for D0099-01, Tyrellspass, in Westmeath 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 2023.

1.2 TREATMENT SUMMARY

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

- Tyrellspass WWTP with a Plant Capacity PE of 2000, 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
TPEFF3200D0099SW001	Tyrellspass WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 TYRELLSPASS WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - TYRELLSPASS 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
Ammonia-Total (as N) mg/l	12	55	27
BOD, 5 days with Inhibition (Carbonaceous) mg/l	12	814	278
Total Nitrogen mg/l	12	275	64
Total Phosphorus (as P) mg/l	12	61	14
pH pH units	12	7.70	7.31
ortho-Phosphate (as P) - unspecified mg/l	12	10	4.34
COD-Cr mg/l	12	1487	643
Suspended Solids mg/l	12	2440	401
Hydraulic Capacity	N/A	881	247

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 - TPEFF3200D0099SW001

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	18	Pass
Suspended Solids mg/l	35	87.5	N/A	12	N/A	N/A	4.96	Pass
pH pH units	6	9	N/A	12	N/A	N/A	7.52	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	8	16	N/A	12	N/A	N/A	2.47	Pass
Ammonia-Total (as N) mg/l	0.5	1	N/A	12	3	N/A	0.260	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.26	0.52	N/A	12	1	N/A	0.164	Pass
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.228	

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)
Nitrite (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.135	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	15	
Total Oxidised Nitrogen (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	14	
Conductivity @20°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	651	
Nitrate (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	14	

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):

Plant or equipment breakdown at WWTP.

Significance of Results:

The WWTP is non compliant with the ELV's set in the Wastewater Discharge Licence. The impact on receiving waters is assessed further in Section 2.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF3200D0099SW001

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	240896, 238378	RS25T070150	No	No	No	No	Moderate
Downstream	238455, 239453	RS25T070680	No	No	No	No	Moderate

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	RS25T070150	1.06	RS25T070680	1.65	1.50	39.8
Ammonia-Total (as N) mg/l	RS25T070150	0.054	RS25T070680	0.065	0.065	17.2
ortho-Phosphate (as P) - unspecified mg/l	RS25T070150	0.011	RS25T070680	0.016	0.035	16
Total Phosphorus (as P) mg/l	RS25T070150	0.054	RS25T070680	0.083	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
Conductivity @20°C µS/cm	RS25T070150	628	RS25T070680	574	N/A	
pH pH units	RS25T070150	7.79	RS25T070680	7.75	N/A	
Temperature °C	RS25T070150	12	RS25T070680	11	N/A	
Total Nitrogen mg/l	RS25T070150	3.38	RS25T070680	2.98	N/A	
COD-Cr mg/l	RS25T070150	19	RS25T070680	35	N/A	
Dissolved Oxygen % O2	RS25T070150	89	RS25T070680	91	N/A	
Dissolved Oxygen % Saturation	RS25T070150	79	RS25T070680	79	N/A	
Dissolved Oxygen mg/l	RS25T070150	15	RS25T070680	15	N/A	

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: Ammonia-Total (as N) mg/l.

The ambient monitoring results do not meet the required EQS at the downstream monitoring location. 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, BOD & Ortho-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.

As per the 3rd Cycle Lower Shannon (Brosna) Catchment Report (HA 25A), Agriculture is a significant pressures on the At Risk Brosna_050 waterbody. The Tyrellspass WWTP, although listed on Cycle 2 as a significant pressure, has been removed from the list of significant pressures in the Cycle 3 report.

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 - TYRELLSPASS WWTP

2.1.4.1 Treatment Efficiency Report - Tyrellspass 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	5768	1365	76
SS	35933	441	99
TP	1263	20	98
COD	57603	1627	97
cBOD	24945	220	99

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

2.1.4.2 Treatment Capacity Report Summary - Tyrellspass 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.

Tyrellspass WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1350
DWF to the Treatment Plant (m^3/day)	450
Current Hydraulic Loading - annual max (m^3/day)	881
Average Hydraulic loading to the Treatment Plant (m^3/day)	247
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	583
Organic Capacity (PE) - Remaining	1417
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 - TYRELLSPASS WWTP

'Other inputs' to the waste water treatment plant are summarised in the 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)
Breach of ELV	Plant or equipment breakdown at WWTP	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2023	1
Number of Incidents reported to the EPA via EDEN in 2023	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 (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 (m^3)	Monitoring Status
SW2	240821,238268	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 (m^3)?	Unknown
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
D0099-SIP:01	Waste Water treatment plant and ancillary works	C	01/12/2014	Yes	Works Completed		

A summary of the status of any other improvements identified by under Condition 5 assessments- is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
No additional improvements planned at this time.				

4.2.3 SEWER INTEGRITY RISK ASSESSMENT

N/A

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
Priority Substances Assessment	Yes	No
Small Stream Risk Score Assessment	Yes	Yes

6 CERTIFICATION AND SIGN OFF

6.1 SUMMARY OF AER CONTENTS

Parameter	Answer
Does the AER include an Executive Summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Is there a need to advise the EPA for Consideration of a Technical Amendment/Review of the Licence?	No
List reason e.g. additional SWO identified	N/A
Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc	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: 27/02/2024

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

SSRS Compliance Monitoring: *Tyrrellspass* Waste Water Treatment Plant 2023

Report to Uisce Éireann

Limnos Consultancy, January 2024

Contents

Tyrrellspass WWTP

Introduction

Small Streams Risk Score (SSRS) assessments on the Tyrrellspass Stream upstream and downstream of the Tyrrellspass waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 27 October 2023. Limnos Consultancy was contracted by Irish Water to undertake the surveys.

Methodology

Small Streams Risk Score (SSRS)

Samples were taken using an ISO compliant kick-sampling sampling method compatible with the Environmental Protection Agency (EPA) Standard Operating Procedure for sampling aquatic macroinvertebrates. Samples were taken upstream and downstream of the discharge from the WWTP. SSRS results were assigned based on the macroinvertebrate fauna.

The author was the main initiator of the SSRS system developed by the Western River Basin District and the EPA under his supervision in 2005–2006 (McGarrigle 2014). He has undertaken SSRS training of local authority and other professional staff at the Local Government Water Services Training Centres around the country for over 100 personnel.

The SSRS was calculated based on selected sub-groups of the macroinvertebrates recorded. The score is calculated based on the number of taxa and their relative abundance in four main invertebrate groups as follows:

Group 1: Ephemeroptera (excluding *Baetis rhodani*)
Group 2: Plecoptera
Group 3: Trichoptera
Group 4: GOlD (Gastropoda, Oligochaeta, Diptera)
Group 5: *Asellus*

The first three groups above, mayflies, stoneflies, and caddis flies, are regarded as pollution-sensitive whereas gastropods, oligochaetes, dipterans and *Asellus* are relatively pollution-tolerant. The maximum score that can be achieved is

11.2 and threshold scores deciding the degree of risk of not being at good ecological status are as follows:

> 7.25 Probably not at risk
- > 6.5 to 7.25 Indeterminate
< 6.5 Stream may be at risk.

Samples were taken with a standard 1 mm mesh pond net. A 3-minute kick sample was combined with a 1-minute stonewash. Samples were placed on a white tray and, once cleaned of debris such as leaves and twigs and excessive sand or gravel by decanting and hand picking, the sample was examined carefully to identify the macroinvertebrates. At least 25 minutes were spent identifying and assigning each taxon found to a relative abundance category. Table 1 gives the definition of the relative abundance terms Few, Common, Numerous, Dominant and Excessive. The numeric code is used in the results tables below.

Table 1. Relative abundance table.

Abundance	Number of Individual Specimens	Relative abundance numeric code
Few:	1 to 5 individuals	1
Common:	6 to 20	2
Numerous:	21-50	3
Dominant:	51 to 100	4
Excessive:	>100	5

Physico-Chemical Measurements

Physico-chemical measurements were also made for dissolved oxygen, temperature and conductivity using a HACH HQ40d meter with appropriate compatible probes.

Location of Sites Sampled

Figure 1 maps the sampling sites and Table 2 gives the details of the locations sampled.

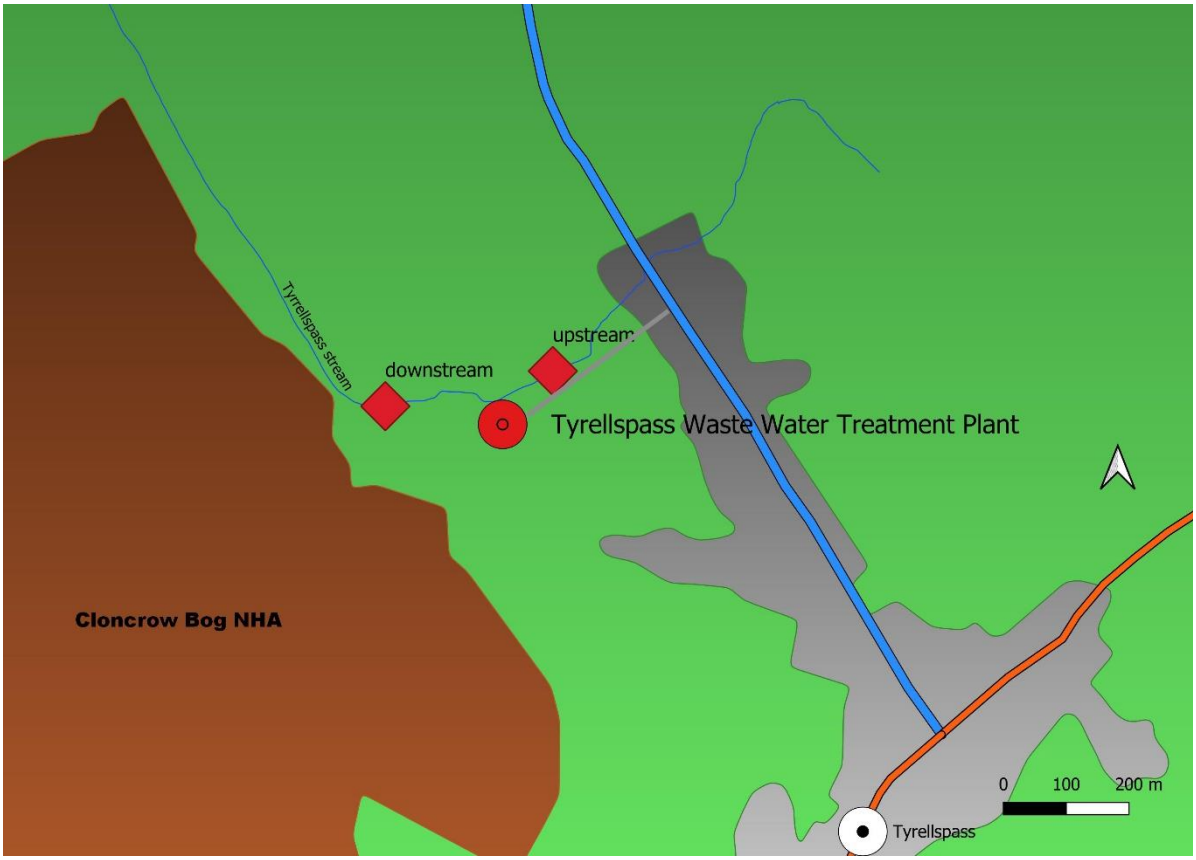

Figure 1. Location of upstream and downstream monitoring sites for Tyrrellspass WWTP. The river flows East to West.

Table 2. Location of sites sampled upstream and downstream of Tyrrellspass WWTP.

Location	Tyrrellspass WWTP Upstream	Tyrrellspass WWTP Downstream
EPA Code	RS25T070150	RS25T070200
Station	Upstream of WWTP	Downstream of WWTP
River	Tyrrellspass Stream	Tyrrellspass Stream
Easting	240897	240629
Northing	238378	238322

Results

Site Photographs

Figure 2 shows photographs for the upstream and downstream of the Tyrrellspass WWTP.

	
U/S Tyrrellspass WWTP looking downstream	U/S Tyrrellspass WWTP looking upstream
	
D/S Tyrrellspass WWTP looking downstream	D/S Tyrrellspass WWTP looking upstream

Figure 2. Upstream (U/S) and downstream (D/S) of Tyrrellspass WWTP.

Macroinvertebrates – SSRS

Table 3 gives the recorded macroinvertebrate taxa for the standard kick samples taken at these sites.

Table 3. Relative abundances of macroinvertebrates recorded upstream and downstream of Tyrrellspass WWTP discharge point.

		Tyrrellspass	**Tyrrellspass**
		Upstream	**Downstream**
SSRS Group	**Taxon**	**27/10/2023**	**27/10/2023**
2, Plec	Leuctra	Few	-
3, Trich	Limnephilidae	-	Common
3, Trich	Odontoceridae	-	Few
3, Trich	Philopotamidae	Common	-
3, Trich	Sericostoma personatum	-	Common
4, GOlD	Chironomidae	Few	Common
4, GOlD	Eiseniella	Few	-
4, GOlD	Lumbriculidae	-	Few
4, GOlD	Simuliidae	Numerous	Few
4, GOlD	Sphaerium	-	Few
4, GOlD	Tubificidae	Few	Few
5, Asellus	Asellus	Dominant	Dominant
n/a	Baetis rhodani	Few	-
n/a	Elmis aenea	Few	-
n/a	Erpobdella octoculata	Few	-
n/a	Gammarus	Numerous	Numerous
n/a	Glossiphonia complanata	-	Few
n/a	Hydrachnidae	Few	Few
n/a	Piscicola	Few	-
n/a	Planaria	Common	Common
	Number Taxa	**14**	**13**
	SSRS	**3.2**	**3.2**
		At Risk	**At Risk**
	Q-Value	**Q3**	**Q3**

The taxa are ordered from top to bottom in terms of their SSRS Grouping. Groups 1 to 3 are sensitive to pollution while Groups 4 and 5 comprise more tolerant taxa. Note that not all taxa are included in the SSRS system.

The upstream site is around 800 m downstream from the marked source of the Tyrrellspass Stream – it is a first-order stream of approximately 2 to 3 m in width. Some 14 taxa were recorded there. The faunal community is dominated by *Asellus*, with *Gammarus*, *Baetis* and Simuliidae numerous or common. The presence of the stonefly *Leuctra* is positive. One uncased caddis, Philopotamidae is also a positive sign. No Group 1 mayflies (apart from *Baetis rhodani*) were found and this reduces the final SSRS Score as does the dominance of *Asellus* and the relatively high number and abundance of the GOlD taxa, particularly with numerous Simuliidae, which are filter feeders. The SSRS of 3.2 is lower than the 4.8 assigned in December 2022.

The site downstream of the WWTP has 13 taxa recorded. While no stoneflies were recorded, the presence of three trichopteran taxa cased caddis taxa: Limnephilidae, Odontoceridae and *Sericostoma* is a positive indication. The lack of mayfly nymphs, the relatively high abundance of *Asellus* and of the GOlD taxa pulls the final SSRS score down to 3.2, putting it in the 'at risk' class.

Physico-Chemical Results

The physico-chemical measurements made in the field on the day of sampling (Table 4) show low dissolved oxygen at 84/85% saturation and very high conductivity and pH values. The low dissolved oxygen may be due to a groundwater influence. The fact that the downstream site dissolved oxygen is not hugely different to the upstream oxygen suggests that the WWTP is not causing significant oxygen depletion in the stream.

Table 4. Physico-chemical results for Tyrrellspass River, 27 October 2023.

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Tyrrellspass WWTP	**85.5**	**9.22**	**11.8**	**773**	**7.73**
Downstream Tyrrellspass WWTP	**84.4**	**9.19**	**11.4**	**722**	**7.65**

Summary

Both sites fell into the 'at risk' SSRS category, with a no significant difference downstream compared with upstream. The scores are slightly lower than those in 2022. The lowish dissolved oxygen may be largely responsible for the low scores. The dissolved oxygen concentrations are similar to those recorded for this survey in 2022. The 2019 Annual Environmental Report for the WWTP also indicates low annual mean dissolved oxygen for the upstream and downstream sites suggesting that these are either natural due to groundwater or that there is an upstream source of pressure on the system separate from the WWTP. Based on the macroinvertebrates listed, both sites are likely to be rated as Q3 or poor – but with the caveat that the low oxygen values may be natural due to the underlying aquifer.

Reference

McGarrigle, M. 2014. "Assessment of Small Water Bodies in Ireland." *Biology and Environment* 114B(3). doi: 10.3318/BIOE.2014.15.