

Annual Environmental Report

2018



Ballymore Eustace WWTP

D0238-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 AER

This Annual Environmental Report has been prepared for D0238-01, Ballymore Eustace WWTP, in Kildare in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified reports are included as an appendix to the AER as follows:

1.1 Licence specific reporting included in AER

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

1.2 Treatment Type

The agglomeration is served by a wastewater treatment plant BALLYMORE EUSTACE NEW WWTP with a Plant Capacity PE of 2000. The treatment process includes the following:

1.2.1 BALLYMORE EUSTACE NEW WWTP

Treatment type	Yes / No	Details
Preliminary Treatment	No	
Primary Treatment	No	
Secondary Treatment	Yes	SBR
Nutrient Removal	Yes	Phosphorus Removal
Tertiary Treatment	No	

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 2.2 Discharges from the agglomeration.

1.3 ELV Overview

1.3.1 BALLYMORE EUSTACE NEW WWTP

Compliance Status	
Were all parameters compliant for BALLYMORE EUSTACE NEW WWTP treatment plant	Yes
Where non compliant see Table 2.2.1 for details of parameters	

1.4 Sludge Removal

The amount of sludge removed from the wastewater treatment plant is shown below along with the transported destination of the sludge from the treatment plant.

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
BALLYMORE EUSTACE NEW WWTP	Liquid Sludge	1338.84	Weight (Tonnes)	2.5	D0002 - Osberstown

Annual Statement of Measures

There were no major capital or operational changes undertaken.

2 MONITORING REPORTS SUMMARY

2.1 Summary report on monthly influent monitoring

A summary of influent monitoring for the treatment plant is presented in below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

2.1.1 Influent Monitoring Summary - BALLYMORE EUSTACE NEW WWTP

Parameters	Number of Samples	Annual Max	Annual Mean
Suspended Solids mg/l	13	552	376.76
COD-Cr mg/l	13	1658	964.39
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	13	417	292.65
Total Phosphorus (as P) mg/l	13	15.4	8.71
Hydraulic Capacity		355	120.4

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 3.5 if applicable.

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2.

2.2 Discharges from the agglomeration

2.2.1 Effluent Monitoring Summary - BALLYMORE EUSTACE NEW WWTP

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)
pH pH units	6 to 9	0	0	13	0	0	6.88	Pass
Ammonia-Total (as N) mg/l	5	6	0	13	0	0	1.43	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	0	13	0	0	2.4	Pass
ortho-Phosphate (as P) - unspecified mg/l	1	1.2	0	13	0	0	0.25	Pass
COD-Cr mg/l	125	250	0	13	0	0	47.79	Pass
Total Phosphorus (as P) mg/l	2	2.4	0	13	0	0	0.64	Pass
Suspended Solids mg/l	35	87.5	0	13	0	0	11.55	Pass
Conductivity 20 C μ S/cm	0	0	0	13	0	0	420.04	N/A
Faecal coliforms MPN/100ml	0	0	0	6	0	0	18164.5	N/A

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):

Not Applicable.

Significance of Results:

The WWTP is compliant with the ELV's set in the Wastewater Discharge Licence.

2.3 Ambient monitoring summary

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.

2.3.1 Ambient Monitoring Report Summary - BALLYMORE EUSTACE NEW WWTP

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	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Upstream	292660, 209723	TPEFF1400D0238SW001	No	No	No	No	Moderate
Downstream	292478, 209783	TPEFF1400D0238SW001	No	No	No	No	Moderate

2.3.2 Ambient Monitoring Parameter Summary - BALLYMORE EUSTACE NEW WWTP

The results for ambient results and / or additional monitoring data sets are included in the **Appendix 7.1 - Ambient Monitoring Summary**.

Significance of Results:

The WWTP discharge was compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results did not meet the required EQS for Ammonia d/s of the WWTP discharge. Where the ambient monitoring results does not meet the EQS this relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

Based on the effluent compliance results, it is considered that the discharge from the WWTP does not have an observable impact on the water quality.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status. The status is Moderate both u/s and d/s of the WWTP discharge.

3 OPERATIONAL REPORTS SUMMARY

3.1 Treatment Efficiency Report

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:

3.1.1 Treatment Efficiency Report Summary - BALLYMORE EUSTACE NEW WWTP

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
TP	341.6	23.69	93.06
cBOD	11478.89	88.39	99.23
SS	14777.9	425.59	97.12
COD	37826.72	1760.42	95.35

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

3.2 Treatment Capacity Report Summary

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.

BALLYMORE EUSTACE NEW WWTP	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	1350
DWF to the Treatment Plant (m ³ /day)	450

BALLYMORE EUSTACE NEW WWTP	
Current Hydraulic Loading - annual max (m³/day)	355
Average Hydraulic loading to the Treatment Plant (m³/day)	120.4
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)	875
Organic Capacity (PE) - Remaining	1125
Will the capacity be exceeded in the next three years? (Yes/No)	No

3.3 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
2	Blocked Sewer	0	2

3.4 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.

3.4.1 Summary of Incidents

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	Other	1	No	Yes

3.4.2 Summary of Overall Incidents

Question	Answer
Number of Incidents in 2018	1
Number of Incidents reported to the EPA via EDEN in 2018	1
Explanation of any discrepancies between the two numbers above	N/A

3.5 Sludge / Other inputs to the 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.							

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:

No Appendix Included.

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 2018 (No. of events)	Total volume discharged in 2018 (m ³)	Monitoring Status
NEW SW2	292495, 209676	No	Low	Meeting	2	597	Monitored
OLD SW2 (Decommissioned)	292637, 209727	Yes	High	Not Meeting	0	0	Monitored
SW3 (Closed Off)	292669, 209687	Yes	Low	Not Meeting	0	0	Monitored

4.1.2 Inspection Summary Report

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m ³)?	597
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?	Yes

SWO Summary

Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?

Yes

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)	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
Discharges from SW1-P (existing WWTP discharge) to cease	A	31/12/2012	Yes	Not Started		The improvement programme will be reviewed by IW to assess the works required to comply with the licence condition on a prioritised basis.
SW2 - Upgrading of SWO to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/12/2012	Yes	Works Completed		
SW3 - Upgrading of SWO to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/12/2012	Yes	Works Completed		
Waste Water treatment plant	C	31/12/2012	Yes	Not Started		The improvement programme will be

Specified Improvement Programmes (under Schedule A and C of WWDL)	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
and ancillary works						reviewed by IW to assess the works required to comply with the licence condition on a prioritised basis.

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	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
Small Stream Risk Score Assessment	Yes	2017	Yes	5.1
Priority Substances Assessment	Yes	2011	No	

5.1 Small Stream Risk Score Assessment

The Small Stream Risk Score Assessment Report is included in Appendix 7.2 - 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
Does SSRS indicate discharges are posing a pollution risk?	No
Downstream SSRS Water Quality Risk	Probably Not At Risk
SSRS Required?	Yes
Upstream SSRS Water Quality Risk	Probably Not At Risk
What is Downstream SSRS?	8

Parameter	Value
What is Upstream SSRS?	9.6
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?	No
List reason e.g. additional SWO identified	N/A
Is there a need to request/advise the EPA of any modifications to the existing WWDL?	No
List reason e.g. changes to monitoring requirements	N/A
Have these processes commenced?	N/A
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: 19/03/2019

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,

Eleanor Roche

Acting Head of Environmental Regulation.

7 APPENDIX

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

Ballymore Eustace 2018 Ambient Monitoring Summary

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)			
			Bathing Water	Drinking Water	FWPM	Shellfish
Upstream Monitoring Point	292660, 209723	RS09L010400				
Downstream Monitoring Point	292478, 209783	RS09L010410	No	No	No	No

Note: Actual Monitoring Point Upstream is 292154E, 210202N (RS09L010490) & Downstream is 292150E, 210336N (RS09L010500).

Discharge Point - 292142E, 210255N & 292141E, 210250N (two sets of coordinates (one for each diffuser) from the discharge point).

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Current WFD Status	cBOD (Mean) mg/l	o-Phosphate (as P) (Mean) mg/l	Ammonia (as N) (Mean) mg/l
Upstream Monitoring Point	Moderate	1.000	0.015	0.139
Downstream Monitoring Point	Moderate	1.091	0.015	0.164
<i>Difference</i>		<i>0.091</i>	<i>0.001</i>	<i>0.025</i>
EQS		2.600	0.075	0.140
% of EQS		3.497%	1.212%	17.532%

Ballymore Eustace Ambient Monitoring Data

Upstream Results							
Date		Ammonia (mg/l)	Ortho P (mg/l)	BOD (mg/l)	Total P (mg/l)	D.O (mg/l)	pH (mg/l)
22-Jan-2018	U/S	0.190	0.020	1.000	0.06	11.10	7.37
16-Feb-2018	U/S	0.220	0.010	1.000	0.06	11.20	7.56
22-Mar-2018	U/S	0.220	0.010	1.000	0.05	11.00	7.42
6-Apr-2018	U/S	0.140	0.020	1.000	0.05	10.70	7.51
24-May-2018	U/S	0.160	0.020	1.000	0.03	9.70	7.56
7-June-2018	U/S	0.130	0.020	1.000	0.05	9.60	7.69
31-July-2018	U/S	0.090	0.020	1.000	0.07	9.20	7.73
23-Aug-2018	U/S	0.070	0.010	1.000	0.05	8.88	7.58
11-Sep-2018	U/S	0.060	0.010	1.000	0.04	9.43	7.63
11-Oct-2018	U/S	0.140	0.010	1.000	0.04	8.85	7.65
20-Nov-2018	U/S	0.110	0.010	1.000	0.08	10.35	7.8
Mean		0.139	0.015	1.000	0.05	10.00	7.59
95%ile		0.220	0.020	1.000	0.08	11.15	7.74

Downstream Results							
Date		Ammonia (mg/l)	Ortho P (mg/l)	BOD (mg/l)	Total P (mg/l)	D.O (mg/l)	pH (mg/l)
22-Jan-2018	D/S	0.260	0.020	1.000	0.06	10.60	7.40
16-Feb-2018	D/S	0.240	0.010	1.000	0.08	11.50	7.57
22-Mar-2018	D/S	0.240	0.020	2.000	0.06	10.90	7.45
6-Apr-2018	D/S	0.170	0.020	1.000	0.05	10.80	7.48
24-May-2018	D/S	0.180	0.020	1.000	0.03	9.80	7.68
7-June-2018	D/S	0.140	0.020	1.000	0.07	9.60	7.81
31-July-2018	D/S	0.110	0.020	1.000	0.07	9.20	7.74
23-Aug-2018	D/S	0.090	0.010	1.000	0.05	8.97	7.66
11-Sep-2018	D/S	0.110	0.010	1.000	0.05	9.52	7.71
11-Oct-2018	D/S	0.140	0.010	1.000	0.05	8.91	7.68
20-Nov-2018	D/S	0.120	0.010	1.000	0.09	10.34	7.760
Mean		0.164	0.015	1.091	0.06	10.01	7.63
95%ile		0.250	0.020	1.500	0.09	11.20	7.79

Small Stream Risk Score (SSRS) Assessment

BALLYMORE EUSTACE WASTEWATER AGGLOMERATION

Co. Kildare

October 2018



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1 INTRODUCTION

This report sets out findings of Small Stream Risk Score (SSRS) assessments at sites upstream and downstream of Ballymore Eustace Waste Water Treatment Plant (WWTP), Co. Kildare. The discharge is to the upper Liffey River.

Assessments were carried out on October 2nd 2018, in good weather conditions during below average flow conditions.

SSRS is a biological risk assessment system for detecting potential sources of diffuse pollution in 1st and 2nd order streams that may be causing main channel sites to fail in reaching Good Ecological Status (Anon., 2009). Sites are evaluated based on their macroinvertebrate assemblage and are assigned to one of 3 risk categories: “At risk”, “May be at risk” and “Probably not at risk”. “Risk” refers to the risk of the watercourse causing water quality problems in larger waterbodies downstream as a result of being polluted.

2 METHODOLOGY

2.1 SSRS

Samples were collected according to the EPA Standard Operating Procedure for River Monitoring adhering to ISO Standard for kick sampling. Under this system, standard 2-minute, travelling, kick-samples are taken in the fast flowing (riffle) areas of the rivers using a long-handled sampling net (250 mm width, mesh size 0.25mm). Riffle areas of streams receive preference in sampling, as the fauna of riffles tends to be more sensitive to pollution impacts. Stone washing is employed to ensure that “clinging” species, e.g. leeches and gastropods, are adequately collected.

Samples were washed and placed in a large, white plastic tray on the bankside and covered in stream water. Samples were then carefully examined and identified in the field, recording absolute abundance of faunal groups for SSRS assessment purposes. Where necessary, and for quality control purposes, some samples were preserved in situ with 70% IMS alcohol; placed in labelled plastic bags and brought back to the laboratory to check identification.

Scores are calculated by examining the relative abundance of faunal groups and through use of standard SSRS fieldsheets and score calculator (Anon., 2009). Scores can range between 0 (lowest; poor water quality) and 11.2 (highest; good water quality). Risk category is assigned based on the individual site score as follows: >7.25 = Probably not at risk; >6.5 – 7.25 = Indeterminate, stream may be at risk; <6.5 = Stream at risk.

3 RESULTS

3.1 SSRS Summary

Appendix 1 contains SSRS field sheets with score calculations included. **Table 1** summarises the location, SSRS score and risk category for upstream and downstream sites. Sampling occurred on October 2nd 2018.

Table 1: SSRS summary 2018 - Ballymore Eustace WWTP

Site	Location (X, Y)	SSRS	SSRS Risk Category
Upstream	292167 210342	9.6	Probably Not At Risk
Downstream	292181 210177	8.0	Probably Not At Risk

3.2 Water Quality

Both sites were “Probably Not At Risk” according to the SSRS. Water quality was reasonable at both sites. The downstream site was slightly poorer than the upstream site in 2018. Both sites had a similar species assemblage, but the downstream site had greater diversity and abundance of pollution tolerant species. Both sites recorded the sensitive mayfly species, *Heptagenia*, while downstream *Ephemera danica* was present. Healthy, native white clawed crayfish (*Austropotamobius pallipes*) were recorded at both sites (**Plate 3**). Flow conditions were excellent for sampling in 2018.

3.3 Site Photographs



Plate 1: Ballymore Eustace WWTP - upstream SSRS site (2/10/2018)

Plate 2: Ballymore Eustace WWTP - downstream SSRS site (2/10/2018)



Plate 3: Ballymore Eustace - healthy white clawed crayfish (2/10/2018)

3.4 SSRS Comparison 2014 - 2018

Table 2 compares SSRS results for sampling for the years 2014 to 2018. **Figure 1**, below, illustrates SSRS trend for the two sites over the past five years. In 2018, the upstream site was slightly better quality compared to downstream. Both sites scored reasonably highly for SSRS in 2018, which is an improvement over previous years.

Table 2: SSRS Comparison 2014 - 2018 Ballymore Eustace WWTP

Site	SSRS					SSRS Risk Category				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
U/S	7.2	8.0	3.2	5.6	9.6	Indet.	PNAR	At Risk	At Risk	PNAR
D/S	7.2	7.2	4.8	8.8	8.0	Indet.	Indet.	At Risk	PNAR	PNAR

“PNAR” = Probably Not At Risk

“Indet.” = Indeterminate – Stream may be At Risk.

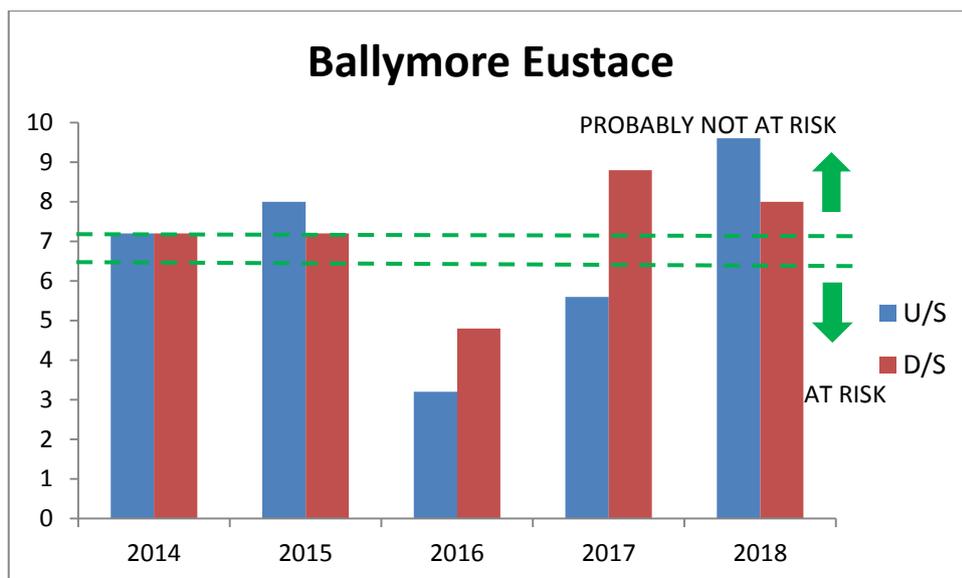


Figure 1 – SSRS Comparison 2014 – 2018 Ballymore Eustace WWTP

4 REFERENCES

Anon. (2009) Small Streams Risk Score (SSRS) Training Manual. A pollution investigation tool for use in the field. White Young Green, Apex Business Centre, Blackthorn Road, Sandyford, Dublin.

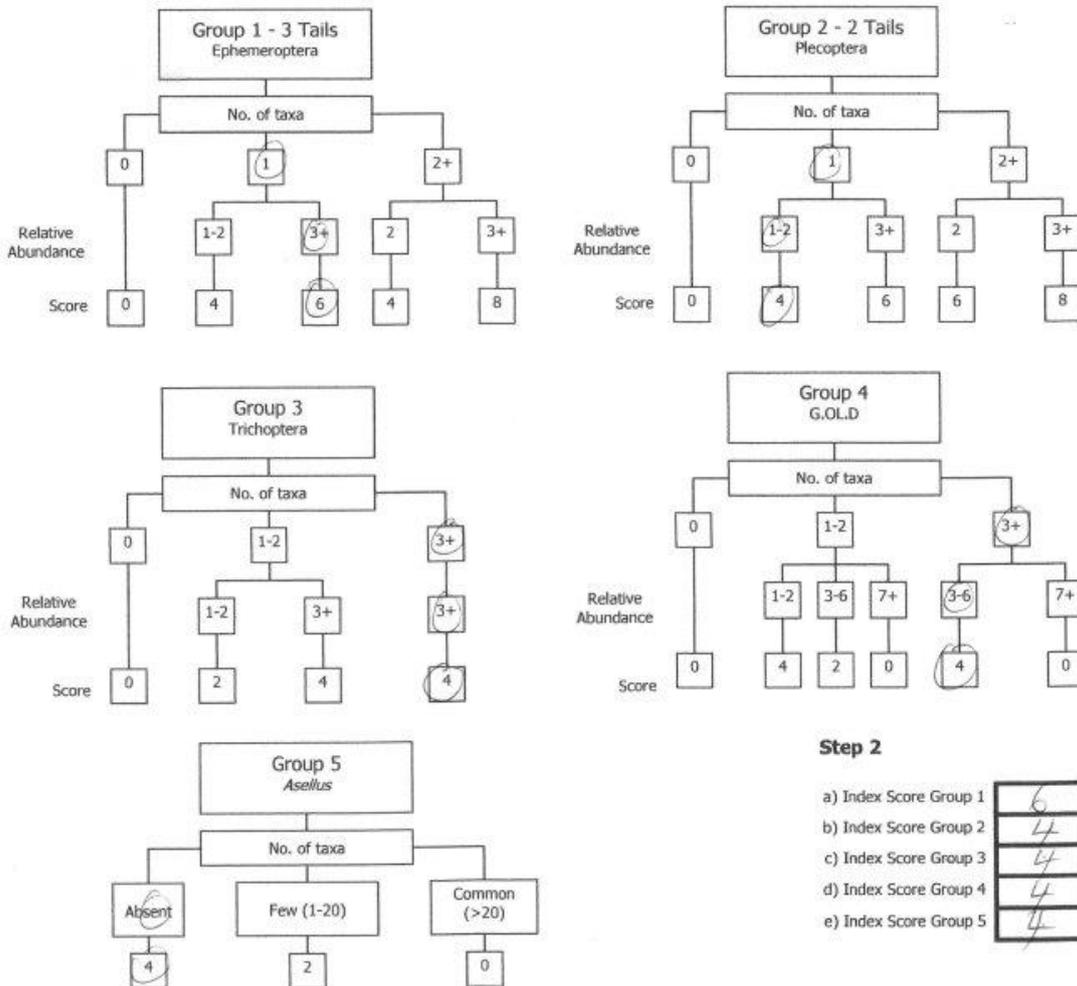
APPENDIX 1 SSRS Sheets

River: LIFFEY		Code: /	Date: 2/10/18	Time: 1:30pm
Station no. u/s		Location: BALLYMORE CUSTACE		Grid (6 figure): N 92181
Field Chemistry		Stream Order: u/s	Stream flow: 10177	
DO%		Modifications: V/N Canalised-widened-bank erosion-arterial drainage	Riffle <input type="checkbox"/>	
DO mg/l		Dominant Types:	Riffle/Glide <input checked="" type="checkbox"/>	
Temp (°C)		Bedrock	Slow flow <input type="checkbox"/>	
Conductivity		Boulder (>128mm) +		
pH		Cobble (32-128mm) ++		
Bank width (cm)	18m	Gravel (8-32mm) +++		
Wet width (cm)	14m	Fine Gravel (2-8mm) ++		
Avg Depth (cm)	30cm	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	Photo: Y / N	
Moderate	Moderate	Substratum: Stony bottom-Muddy bottom-Mud over stones		
Slow	High	Degree of siltation: Clean-Slight-Moderate-Heavy		
Very slow		Depth of mud: None <1cm: 1-5cm: 5-10cm: >10cm		
Clarity	Discharge	Litter: None - Present - Moderate - Abundant		
Very clear	Flood	Filamentous Algae: None - Present - Moderate - Abundant	Sewage Fungus: None - Present - Moderate - Abundant	
Clear	Normal	Main land use u/s: Pasture <input checked="" type="checkbox"/> Urban <input checked="" type="checkbox"/> Bog <input type="checkbox"/> Tillage <input type="checkbox"/> Forestry <input type="checkbox"/> Other <input type="checkbox"/>	Sample retained: Y / N	
Slightly turbid	Low		Sampled in Minutes: Pond net x Stone wash x Weed sweep x	
Highly turbid	Very Low			
	Dry			
	Recent Flood			
General Comments: Low flow. Excellent habitat, more glide than riffle. White clawed Crayfish present x1.				
Macroinvertebrate Composition				Relative Abundance
The macroinvertebrates are divided into the following 5 specific groups:				1-5 1
Group 1 = Ephemeroptera (3-tails) - note that tails may be damaged during sampling				6-20 2
Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling				21-50 3
Group 3 = Trichoptera				51-100 4
Group 4 = G.O.L.D (Gastropoda, Oligochaeta and Diptera)				101+ 5
Group 5 = Asellus				
Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance - Ab)				
Ephemeroptera:	<i>Ecdyonurus</i> Ab		Plecoptera:	<i>Leuctra</i> Ab 2
	<i>Rhythrogena</i> Ab			<i>Isoperla</i> Ab
	<i>Heptagenia</i> Ab 3			<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 1	Total Relative Abundance 3	Total no. of Taxa 1	Total Relative Abundance 2	
Trichoptera:	G.O.L.D:	Chironomidae (D) Ab 2	Asellus:	
Hydropsychidae Ab 3	<i>Lymnaea</i> (G) Ab	<i>Chironomus</i> (D) Ab	Absent <input checked="" type="checkbox"/>	
Polycentropodidae Ab 1	<i>Potamopyrgus</i> (G) Ab	Simuliidae (D) Ab 1	Few/Low	
<i>Rhyacophila</i> Ab 1	<i>Planorbis</i> (G) Ab	<i>Dicranota</i> (D) Ab 1	Common/Numerous	
Philopotamidae Ab	<i>Ancylus</i> (G) Ab	Tipulidae (D) Ab		
Limnephilidae Ab	<i>Physa</i> (G) Ab	Ceratopogonidae (D) Ab		
Sericostomatidae Ab	<i>Lumbriculus</i> (OI) Ab	Other GOLD Ab		
Glossosomatidae Ab	<i>Eiseniella</i> (OI) Ab 1		NOTE: Asellus must be recorded as absent if none are found	
<i>Odontocerum albicorne</i>	Tubificidae (OI) Ab 1			
Lepidostomatidae Ab				
Other Trichoptera Ab 7				
Total no. of Taxa 4	Total Relative Abundance 6	Total no. of Taxa 5	Total Relative Abundance 6	

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*.

BALLYMORE EUSTACE U/S

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 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) **24**

Average Index Score (AIS) TIS/5 (5 for 5 groups) **4.8**

SSR Score (AIS x 2) **9.6**

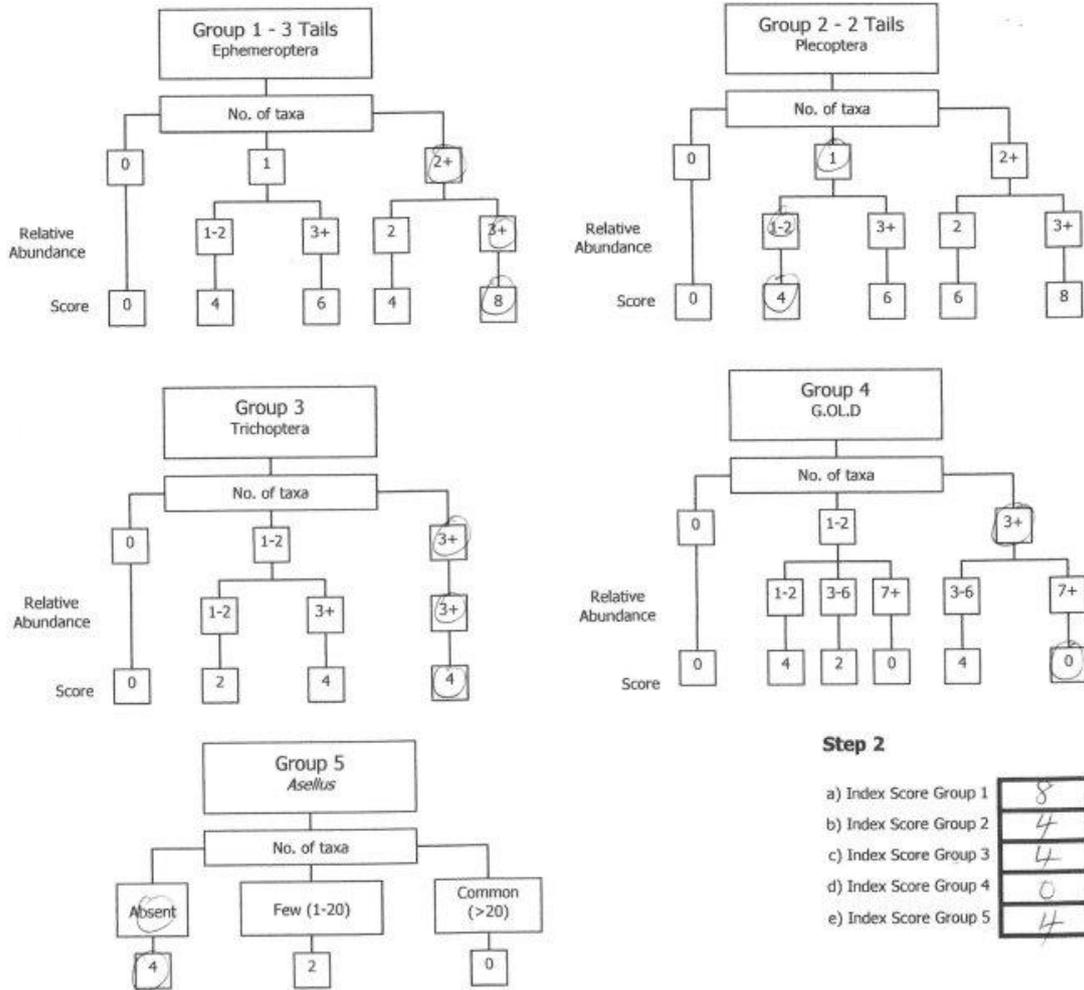
Step 4. Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

> 7.25 Probably not at risk > 6.5 – 7.25 Indeterminate Stream may be at risk < 6.5 Stream at risk

Surveyor (signed): LAUREN MILLIALF Name (print): LAUREN MILLIALF Date: 30.1.18

BALLYMORE EUSTACE D/S

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	8
b) Index Score Group 2	4
c) Index Score Group 3	4
d) Index Score Group 4	0
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)

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): LA WILLIAMS Name (print): AUREN WILLIAMS Date: 31/11/18

