Annual Environmental Report

2018

Coill Dubh

D0242-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 AER

This Annual Environmental Report has been prepared for D0242-01, Coill Dubh, 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 Coill Dubh WWTP with a Plant Capacity PE of 2000. The treatment process includes the following:

1.2.1 Coill Dubh WWTP

Treatment type	Yes / No	Details
Preliminary Treatment	Yes	Screening
Primary Treatment	No	
Secondary Treatment	Yes	Two SBRs
Nutrient Removal	Yes	Ferric dosing
Tertiary Treatment	Yes	Two tertiary sand filters

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 Coill Dubh WWTP

Compliance Status	
Were all parameters compliant for Coill Dubh WWTP treatment plant	No
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
Coill Dubh WWTP	Liquid Sludge	4338.54	Weight (Tonnes)	2.5	D0002 Osberstown WWTP

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 - Coill Dubh WWTP

Parameters	Number of Samples	Annual Max	Annual Mean
Total Phosphorus (as P) mg/l	11	9.95	5.75
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	11	327	239.19
Total Nitrogen mg/l	10	52	39.84
COD-Cr mg/l	11	1127	620.16
Suspended Solids mg/l	11	553	233.38
Hydraulic Capacity		967	312

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 - Coill Dubh 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)
Total Phosphorus (as P) mg/l	0.5	0.6	0	13	0	0	0.22	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	8	16	0	13	0	0	1.03	Pass
Conductivity 20 C µS/cm	0	0	0	13	0	0	487.69	N/A
COD-Cr mg/l	125	250	0	13	0	0	23.93	Pass
True Colour Pt Co Units	0	0	0	13	0	0	22.45	N/A
Ammonia-Total (as N) mg/l	0.5	1	0	16	2	1	0.31	Fail
pH pH units	6 to 9	0	0	13	0	0	7.44	Pass
Total Nitrogen mg/l	0	0	0	13	0	0	2.98	N/A
Suspended Solids mg/l	10	25	0	13	0	0	2.7	Pass

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)
ortho-Phosphate (as P) - unspecified mg/l	0.25	0.5	0	13	0	0	0.12	Pass

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):

WWTP biological sludge issue.

Significance of Results:

The WWTP was non-compliant with the ELV's set in the Wastewater Discharge Licence. There were 2 exceedances in relation to the Ammonia-Total (as N) parameter, one of which was above the Condition 2 ELV. The impact on receiving water is assessed further in Section 2.3.

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 - Coill Dubh 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	278857, 226765	TPEFF1400D0242SW001	No	No	No	No	Poor

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Downstream	278857, 226765	TPEFF1400D0242SW001	No	No	No	No	Poor

2.3.2 Ambient Monitoring Parameter Summary - Coill Dubh WWTP

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
pH pH units	RS14S010000	7.68	RS14S010011	7.71		
Total Phosphorus (as P) mg/l	RS14S010000	0.08	RS14S010011	0.11		
Suspended Solids mg/l	RS14S010000	1.23	RS14S010011	1.92		
True Colour Pt Co Units	RS14S010000	76.19	RS14S010011	77.76		
ortho-Phosphate (as P) - unspecified mg/l	RS14S010000	0.04	RS14S010011	0.05	0.075	22.6
Temperature °C	RS14S010000	16.5	RS14S010011	16.5		
BOD - 5 days (Total) mg/l	RS14S010000	1.04	RS14S010011	1.15	2.6	4.4
COD-Cr mg/l	RS14S010000	25.96	RS14S010011	29.27		
Total Nitrogen mg/l	RS14S010000	1.03	RS14S010011	1.57		
Ammonia-Total (as N)	RS14S010000	0.05	RS14S010011	0.09	0.14	31

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
mg/l						
Dissolved Oxygen mg/l	RS14S010000	10.06	RS14S010011	10.15		

Significance of Results:

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

The ambient monitoring results meet the required EQS. Where the ambient monitoring results meet the EQS this relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

The discharge from the WWTP does not have an observable negative impact on the water quality.

It is noted however that consistent achievement with the ELVs would benefit the quality of the receiving water.

The discharge from the WWTP has no observable negative impact on the Water Framework Directive status.

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 - Coill Dubh WWTP

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
cBOD	24953.49	112.14	99.55
TN	4072.1	323.22	92.06
COD	64697.61	2596.1	95.99
SS	24346.63	292.84	98.8
TP	599.85	23.93	96.01

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.

Coill Dubh WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1229
DWF to the Treatment Plant (m^3/day)	460
Current Hydraulic Loading - annual max (^{m3}/day)	967
Average Hydraulic loading to the Treatment Plant (m^3/day)	312
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)	1352
Organic Capacity (PE) - Remaining	648
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
1	Blocked Sewer	0	1

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	EO caused by pump failure	1	No	No
Uncontrolled release	Plant or equipment breakdown at WWTP	1	No	No
Non-compliance	WWTP biological sludge issue	2	No	No
Uncontrolled release	Plant or equipment breakdown at WWTP	1	No	Yes
Uncontrolled release	EO caused by pump failure	1	No	No

3.4.2 Summary of Overall Incidents

Question	Answer
Number of Incidents in 2018	6
Number of Incidents reported to the EPA via EDEN in 2018	6
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)
Other	1,216	Volume (m^3)	15	1.28	Yes	Yes	No

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
SW002	279410, 227030	Yes	Low	Meeting			Not Monitored

4.1.2 Inspection Summary Report

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m^3)?	Not Monitored
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	No
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	No

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
There are no Specified Improvement Programmes for this Agglomeration.						

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

Parameter	Value
Condition 5 Improvement Programme Reference	Na
Does SSRS indicate discharges are posing a pollution risk?	Yes
Does improvement programme include any procedural and/or infrastructural works?	Yes
Downstream SSRS Water Quality Risk	At Risk
SSRS Required?	Yes
Upstream SSRS Water Quality Risk	At Risk

Parameter	Value
What is Downstream SSRS?	2.4
What is Upstream SSRS?	3.2

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?	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: 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 - Small Stream Risk Score Assessment

Small Stream Risk Score (SSRS) Assessment

COILL DUBH WASTEWATER AGGLOMERATION

Co. Kildare

October 2018

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For: Kildare County Council, Water Services Section, Osberstown WWTP, Kildare County Council, Naas, Co. Kildare

Document Control:

Version	Date	Author	Signature
1	03/12/2018	L. Williams	

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1 INTRODUCTION

This report sets out findings of Small Stream Risk Score (SSRS) assessments at sites upstream and downstream of Coill Dubh Waste Water Treatment Plant (WWTP), Co. Kildare. The discharge is to the West Cooleragh Stream.

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

Table 1: SSRS summary 2018 - Coill Dubh WWTP

Site	Location (X, Y)	SSRS	SSRS Risk Category
Upstream	279534 227143	3.2	At risk
Downstream	278841 226739	2.4	At risk

3.2 Water Quality

Upstream and downstream sites were "At risk" in 2018 according to the SSRS. Both sites had low SSRS totals, indicating poor water quality, with the downstream site slightly poorer than upstream. Macroinvertebrate assemblages at both sites lacked sensitive fauna and were dominated by forms that are tolerant of organic pollution. The downstream site had a reduced relative abundance of the pollution tolerant crustacean, *Asellus aquaticus*, and worms (Tubificidae) relevant to sampling from 2014-2016. This has resulted in the best scores to date in 2017 and 2018 at the downstream site, marking an improvement in water quality. A new treatment plant had been in operation for approximately 18 months prior to SSRS sampling in 2018. A juvenile white clawed crayfish (*Austropotamobius pallipes*) was present upstream, while downstream, a juvenile trout "parr" (*Salmo trutta*) was captured during sampling.

3.3 Site Photographs

Plate 1: Coill Dubh WWTP - upstream SSRS site. (2/10/18)

Plate 2: Coill Dubh WWTP - downstream SSRS site (2/10/18)

3.4 SSRS Comparison 2014 - 2018

Table 2 compares SSRS results for sampling covering the years 2014 to 2018. **Figure 1** illustrates the trends for each year. Results for 2018 were identical to 2017, continuing the recent, slight improvement over previous years at the downstream site. To date, the upstream site is slightly better than the downstream site, although both sites are consistently of poor quality.

Table 2: SSRS Comparison 2014 - 2018 - Coill Dubh WWTP

Site	SSRS					SSRS Risk Category				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
U/S	2.4	2.4	3.2	3.2	3.2	At risk	At risk	At risk	At risk	At risk
D/S	0.4	0.0	0.0	2.4	2.4	At risk	At risk	At risk	At risk	At risk

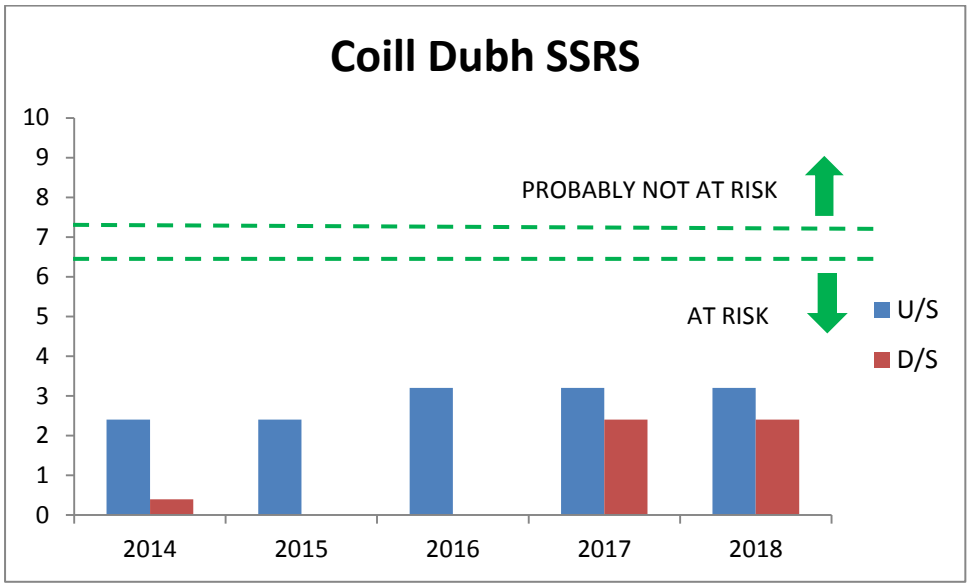
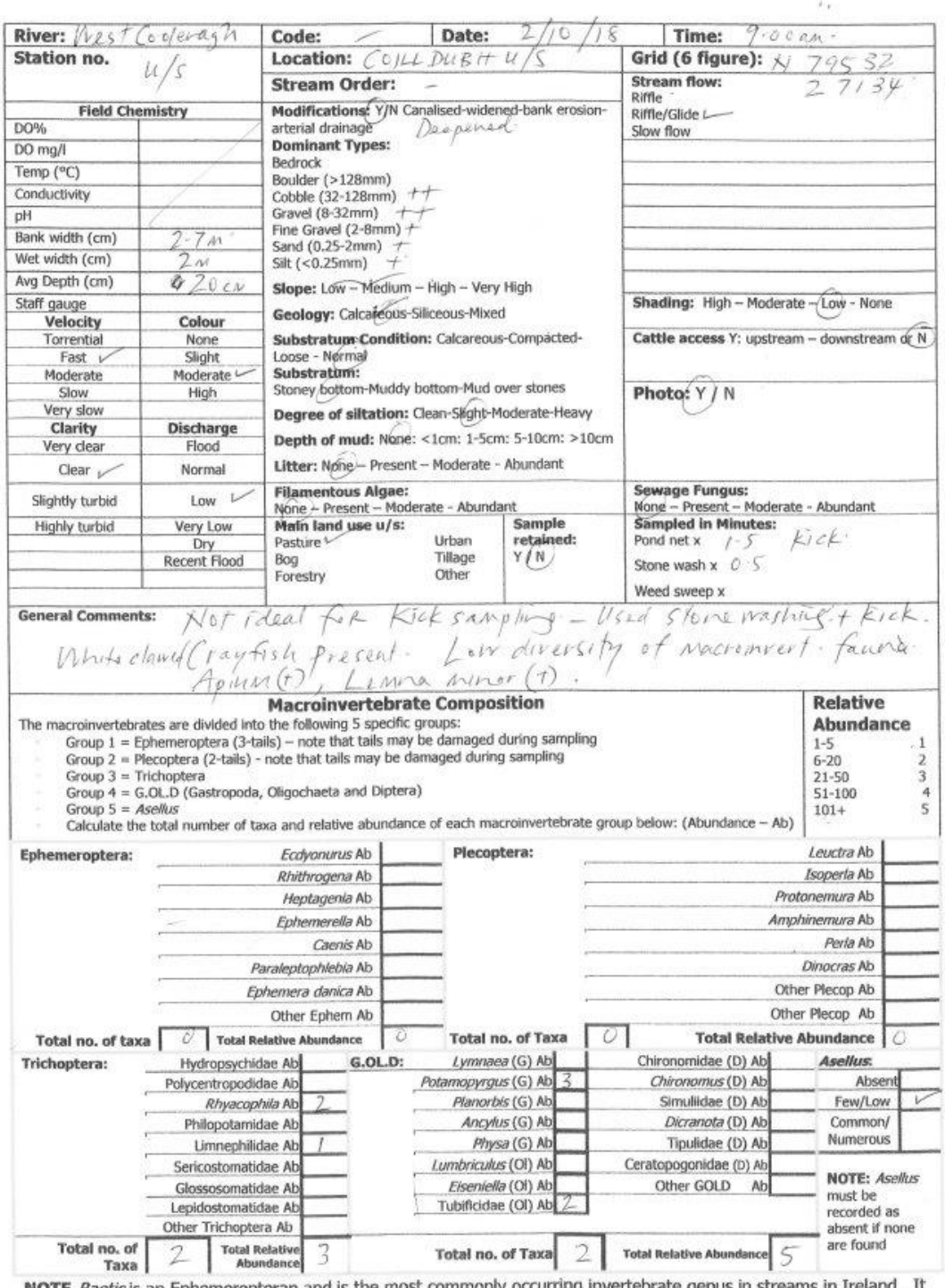


***Figure 1** – SSRS Comparison 2014 - 2018 Coill Dubh WWTP*

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: West Cooleragh | **Code:** | **Date:** 2/10/18 | **Time:** 9.00am

Station no. u/s | **Location:** COILL DUBH u/s | **Grid (6 figure):** N 795 32 27134

Stream Order: –

Stream flow: Riffle / Riffle/Glide ✓ / Slow flow

Field Chemistry

DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	2-7m
Wet width (cm)	2m
Avg Depth (cm)	@ 20cm
Staff gauge	

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 Deepened

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

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Filamentous Algae: None – Present – Moderate - Abundant

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

Sample retained: Y / N

Sewage Fungus: None – Present – Moderate - Abundant

Sampled in Minutes:
Pond net x 1-5 kick
Stone wash x 0·5
Weed sweep x

General Comments: Not ideal for Kick sampling – Used Stone washing + kick. White clawed Crayfish Present. Low diversity of macroinvert. fauna. Apium (T), Lemna minor (T).

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

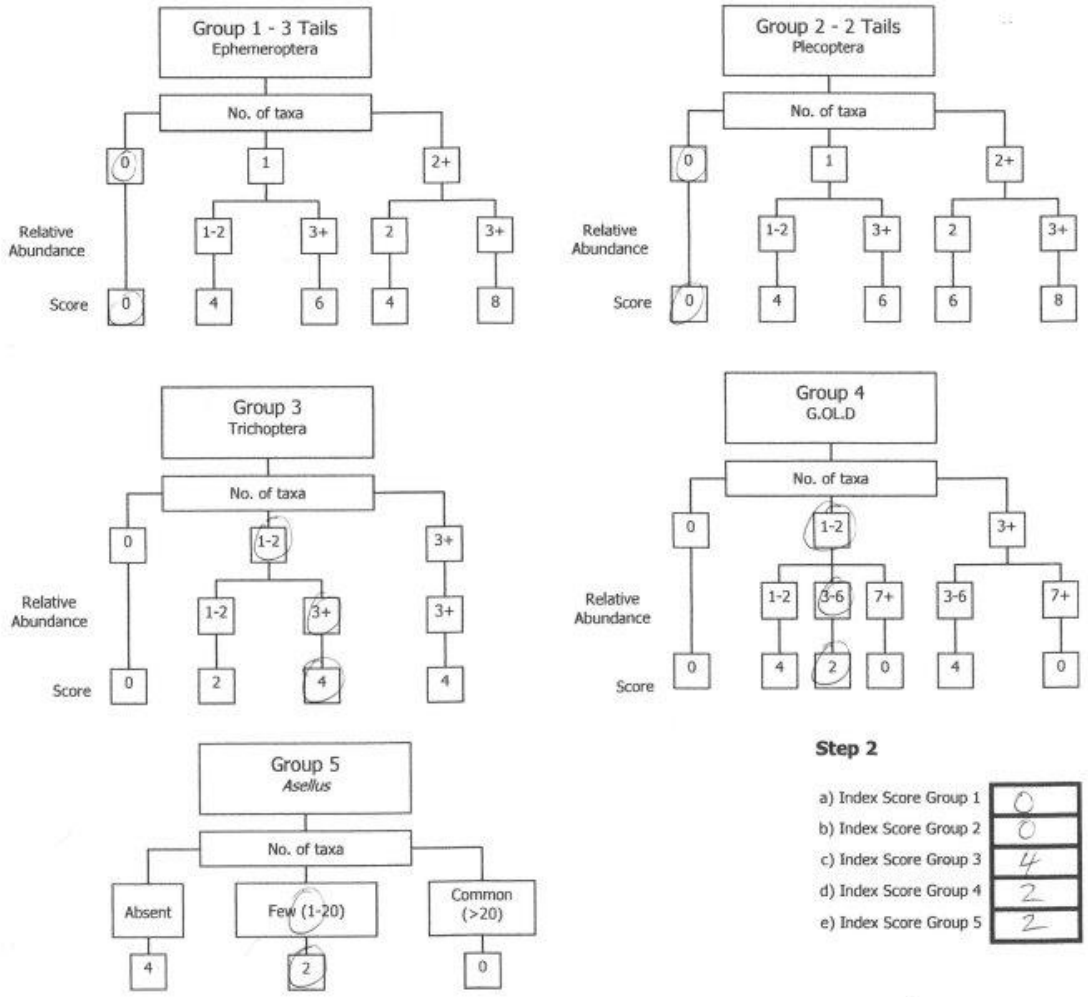
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab	3	*Chironomus* (D) Ab		Few/Low	✓
Rhyacophila Ab	2	*Planorbis* (G) Ab		Simulilidae (D) Ab		Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab	1	*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab	2				
Other Trichoptera Ab							
Total no. of Taxa	2	**Total Relative Abundance**	3	**Total no. of Taxa**	2	**Total Relative Abundance**	5

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*.

COILL DUBH 4/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	0
b) Index Score Group 2	0
c) Index Score Group 3	4
d) Index Score Group 4	2
e) Index Score Group 5	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)	8	Average Index Score (AIS) TIS/5 (5 for 5 groups)	1·6	**SSR Score** (AIS x 2)	3·2

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): L Williams Name (print): LAUREN WILLIAMS Date: 30 / 11 / 18

River: West Cooleragh	**Code:** – **Date:** 2/10/18	**Time:** 9.30 am.
Station no. D/S	**Location:** COILL DUBH D/S	**Grid (6 figure):** N 78841 26739
	Stream Order: –	**Stream flow:** Riffle / Riffle/Glide ✓ / Slow flow

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	4.0 m
Wet width (cm)	2.6 m
Avg Depth (cm)	15 cm.
Staff gauge	
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 Deepened

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

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N
Heifers. Horses

Photo: Y / N

Sewage Fungus: None – Present – Moderate - Abundant

Sampled in Minutes: Kick.
Pond net x 1.5
Stone wash x 0.5.
Weed sweep x

General Comments: No instream veget°. Horses accessing stream – quite disturbed. 1x trout parr in sample. Low diversity fauna.

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

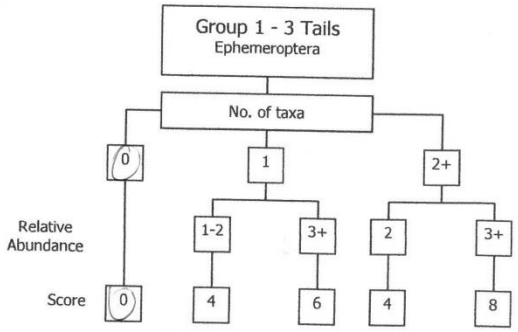
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab	2	*Chironomus* (D) Ab	1	Few/Low	✓
Rhyacophila Ab		*Planorbis* (G) Ab		Simulidae (D) Ab		Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab	3				
Other Trichoptera Ab							
Total no. of Taxa	0	**Total Relative Abundance**	0	**Total no. of Taxa**	3	**Total Relative Abundance**	6

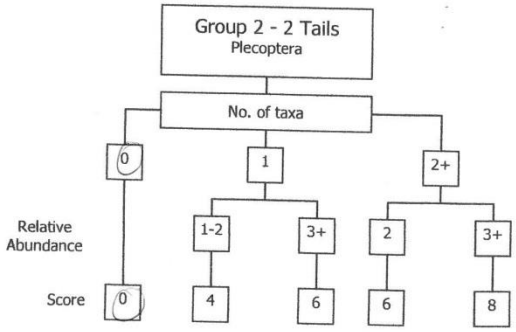
NOTE: *Asellus* must be recorded as absent if none are found

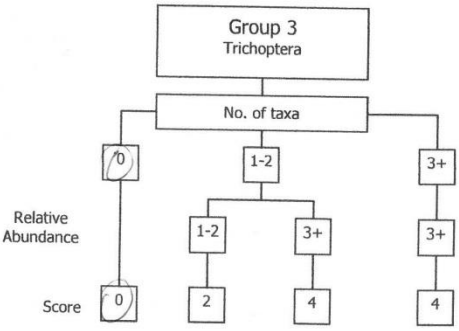
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

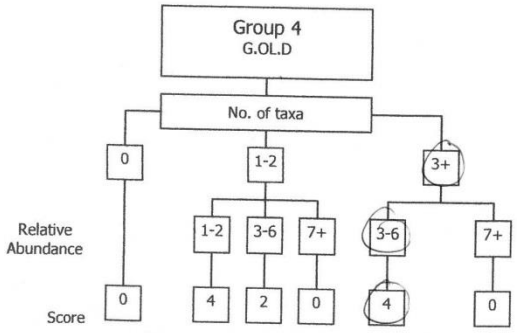
COILL DUBH D/S.

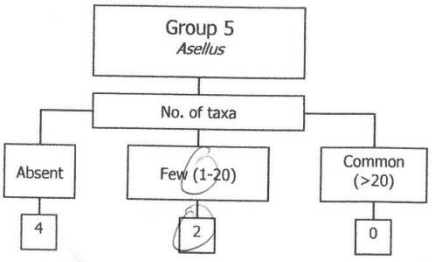
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	0
b) Index Score Group 2	0
c) Index Score Group 3	0
d) Index Score Group 4	4
e) Index Score Group 5	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)	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): LWilliams Name (print): LAUREN WILLIAMS Date: 30/11/18